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PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY,

HELD AT PHILADELPHIA,

FOR

PROMOTING USEFUL KNOWLEDGE.

VOL. II.

JANUARY, 1841, TO JUNE, 1843.

PHILADELPHIA:
1844.

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NOTICE.

Devises and Legacies to the Society should be made in its corporate title—"The American Philosophical Society, held at Philadelphia, for Promoting Useful Knowledge."

Donations intended for the Society, should be addressed to "The American Philosophical Society; care of the Librarian, Philadelphia." If left with any of the following named persons, who have kindly offered their services on behalf of the Society, they will be promptly forwarded:

LONDON. William Vaughan, Esq., Fenchurch Street.

PARIS. Hector Bossange, Esq., Bookseller, Quai Voltaire.

HAMBURG. John Cuthbert, Esq., Consul of the United States.

LEGHORN. John B. Sartori, Esq., Merchant.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. JANUARY, 1841. No. 15.

Stated Meeting, January 1.

Present, twenty members.

Dr. PATTERSON, Vice President, in the Chair.

The judges of the annual election, held this day, reported that the following officers had been chosen for the present year:—

President.

Peter S. Du Ponceau, LL.D.

Vice Presidents.

Nathaniel Chapman, M.D.,
Joseph Hopkinson, LL.D.,
Robert M. Patterson, M.D.

Secretaries.

Franklin Bache, M.D.,
John K. Kane,
Alexander Dallas Bache, LL.D.,
Robley Dunglison, M.D.

Counsellors for Three Years.

Robert Hare, M.D.,
William Hembel,
Charles D. Meigs, M.D.,
Henry Vethake, LL.D.

Counsellor for One Year,

(In the place of William H. Keating, deceased.)

Joseph Henry, LL.D.

Curators.

John P. Wetherill,
Isaac Hays, M.D.,
Franklin Peale.

Treasurer.

John Vaughan.

A letter was received from the Minister of the Interior of Holland, in behalf of the Royal Library of the Hague, acknowledging the receipt of the Transactions of the Society.

The following donations were received:—

FOR THE LIBRARY.

Reports of a Committee formed in Calcutta for investigating the Resources of India, with reference to Coal and Iron. Calcutta, 1838.—*From the Asiatic Society of Bengal.*

Asiatic Researches of the Asiatic Society of Bengal. Vol. XIX. Part II. 4to. Calcutta, 1839.—*From the same.*

Annual Report of H. R. Schoolcraft, Acting Superintendent of Indian Affairs for Michigan, to P. H. Crawford, Esq., Commissioner of Indian Affairs. Detroit, 1840.—*From the Author.*

A Catalogue of the Plants found in the Vicinity of Milwaukie, Wisconsin Territory. By J. A. Lapham. Milwaukie, 1838.—*From the Author.*

The South Western Journal. Nos. 1 to 15 inclusive (No. 5 wanting). Natchez, 1837, 1838.—*From Mr. C. G. Forshey.*

Traité Élémentaire d'Astronomie Physique, par J. B. Biot; avec des Additions d'Astronomie Nautique, par M. de Rossel. 3 Vols. 8vo. Paris, 1810, 1811.—*From Mr. Vaughan.*

A Treatise on the Administration of the Finances of France, translated from the French of M. Necker. By Thomas Mortimer. 3 Vols. 8vo. London, 1785.—*From the same.*

Nouveau Dictionnaire Universel des Synonymes de la Langue Française, par F. Guizot. 2 Vols. 8vo. Paris, 1822.—*From the same.*

L'Art de parler et d'écrire correctement la Langue Française; ou Grammaire Philosophique et Litteraire, par l'Abbé Levizac. 2 Vols. 8vo. Paris.—*From the same.*

Histoire d'Haiti depuis la découverte jusque 1824, époque des dernières Négotiations entre la France et le Gouvernement Haitien, par Charles Malo. Paris, 1825.—*From the same.*

Précis Historique des Négociations entre la France et St. Domingue, suivi des pièces justificatives et d'une notice Biographique sur le Général Boyer, par M. Waller. Paris, 1826.—*From the same.*

Deliciæ Cobresianæ: Catalogue of Mr. Cobres' Library of Natural History. 2 Vols. 8vo. Augusta, 1782.—*From the same.*

FOR THE CABINET.

A Lithographic Drawing of the Statue of Sir Isaac Newton, by Roubilliac.—*From the Rev. C. Turner, F.R.S.*

The Committee, consisting of Mr. Lea, Dr. Wood, and Dr. Coates, to whom was referred, on the 18th of December last, the continuation of Mr. Nuttall's communication, entitled "On the Corymbiferæ, collected on a tour across the continent of North America," reported in favour of its publication in the Transactions, which was ordered accordingly. The Committee of Publication was authorized to print it continuously with Mr. Nuttall's former paper on the same subject.

Dr. Emerson reverted to the oral communication made at the last meeting in regard to the evolution of electricity from steam.

He was pleased to find the results of more recent investigations, and especially of the experiments of the gentleman who introduced the subject before the Society, sustaining the view he had taken in his lectures on Meteorology, delivered before the Franklin Institute in the year 1834. In these lectures he had expressed his opinion that the electricity developed in thunder storms, was to be regarded rather as an accompaniment than a cause of the storm. The vapour condensed was derived from the spot where the storm prevailed, and the electricity was set free during the condensation of the vapour, in a manner similar to the evolution of latent heat. Dr. Emerson read a portion of the lecture delivered before the Franklin Institute at the time alluded to, as more fully explanatory of his views relative to the evolution of electricity during the condensation of vapour.

Professor H. D. Rogers communicated some observations upon the geological structure of Berkshire, Mass., and the neighbouring parts of New York, which had been made by his brother, Professor W. B. Rogers, and himself, in the month of August last; and indicated the theory by which they concurred in explaining the phenomena which characterize that region.

Professor Rogers adverted to the fact, already noticed by geologists, that all the strata between the Hoosac mountain and the Hudson river, hold an inverted order, the newer being found beneath the older rocks. He exhibited drawings of these strata, establishing the existence of numerous *closely folded* anticlinal and synclinal *axes*; and deduced the conclusion by a train of reasoning, that the inverted dip of the rocks at the surface is the result of a folding or wrinkling of the beds at short intervals, and not of one general turning over of the whole series as suggested by geologists.

Subterranean igneous action was referred to, as having effected this compressing and folding of the rock; and its energy was shown to have

been greatest along the Berkshire valley and the ridges east. A solution was thus given of the difficult problem of the crystalline or primary character of the Berkshire marble, and the adjoining micaceous and talcose schists, whose secondary origin was contended for. In the opinion of Professor Rogers, the Berkshire marble was clearly established to be merely the blue limestone of the Hudson valley, extensively metamorphosed by heat and the associated micaceous, talcose, and other schists, referred to the slaty beds of the lowest formation of the Apalachian secondary system. He considered it highly probable also, that the semi-vitrified quartz rock of the western part of the Hoosac mountain is nothing else than the highly altered white sandstone at the base of the same series.

Mr. Kane read portions of a correspondence between Mr. Justice and the Secretary of the Commonwealth of Pennsylvania, in relation to the astronomical instruments recently imported for the High School of this city, and to the propriety of an appropriation by the State for the maintenance of a public observatory. On motion of Mr. Kane, the correspondence was referred to the Committee on the Observatory.

Mr. Peale, chief coiner of the Mint, submitted to the inspection of the members, a complete series of the coins of the United States for 1841.

Dr. Dunglison, from the Secretaries, reported that they had fixed the future annual subscription price of the extra copies of the Society's Proceedings, at One Dollar.

Stated Meeting, January 15.

Present, twenty-four members.

Mr. Du Ponceau, President, in the Chair.

Letters were read, from Mr. Eyries, of Paris, acknowledging the honour done him by his election to membership, and from M. Flourens, Secretary of the Academy of Sciences, Institute of France, acknowledging the receipt of the Proceedings of the Society, for May, June and July, 1840.

The following donations were received:—

FOR THE LIBRARY.

The Boston Journal of Natural History, containing Papers and Com-

munications read before the Boston Society of Natural History, and published by their direction. Vol. III. Nos. 1, 2, and 3. 8vo. Boston, 1840.—*From the Society.*

Essay on Meteorological Observations, by J. N. Nicollet, Esq. Printed by order of the War Department. 8vo. Washington, 1839.—*From Col. Abert.*

Friedrich Schiller's Geschichte des dreyssig-jährigen Kriegs. Fortgesetzt von Karl Ludwig von Woltmann. 4 Vols. 12mo. Leips. 1802, 1809.—*From Mr. Du Ponceau.*

Geschichte des sieben-jährigen Krieges in Deutschland, von 1756 bis 1763, durch J. W. Von Archenholtz, vormals Hauptmann in Königl. Preuss. Diensten. 12mo. Berlin, 1791.—*From the same.*

Report on the Manufacture of Iron; addressed to the Governor of Maryland, by J. H. Alexander, Topographical Engineer of the State. 8vo. 1840.—*From the Author.*

An Address before the Philomathean Society of the University of Pennsylvania, Nov. 3, 1840, by Geo. W. Bethune.—*From Rev. Dr. Bethune.*

The American Journal of the Medical Sciences, edited by Isaac Hays, M.D., Surgeon to Wills Hospital, Physician to the Philadelphia Orphan Asylum, &c., &c. No. I. New Series. Jan. 1841.—*From the Editor.*

The American Medical Library and Intelligencer, a concentrated record of Medical Science and Literature, by Robley Dunglison, M.D. &c. &c. Nos. 16 and 17, for Nov. 15, and Dec. 1, 1840.—*From the Editor.*

Carte de la Louisiane et du cours du Mississipi, dressée sur un grand nombre de Mémoires, entre autres sur ceux de M. le Maire, par Guillaume de l'Isle, de L'Académie Royale des Sciences.—*From Mr. Du Ponceau.*

Fac Simile of a part of an Indian and French MS. of 100 pages, found at the King's Indian Trading Posts on the Labrador Coast of America.—*From the same.*

Dr. Dunglison, on behalf of the Historical and Literary Committee, presented their minutes, and reported their action upon various items of business, heretofore referred to them by the Society. In accordance with the recommendation of the Committee, a request from Mr. Nicollet, to be permitted to with-

draw for amendment his paper, entitled, "Notions sur la Langue des Sioux," was acceded to by the Society.

In pursuance of a recommendation from the same committee, it was ordered that the Rev. Mr. Heckewelder's memoir "On the Names of Certain Trees, &c. in the Lennape Language," be published in the Society's Transactions.

Mr. Walker read a continuation of his paper, entitled "Researches concerning the Periodical Meteors of August and November;" which was referred to the committee having charge of the former part of the paper.

Mr. Lea presented a paper, entitled "New Fresh Water and Land Shells;" which was read, and referred to a committee.

Professor A. D. Bache presented a paper, entitled "Observations on the Storm of December 15th, 1839, by William Redfield, A.M.:" which was read, and referred to a committee.

Mr. Walker presented a letter from Professor Peirce, of Cambridge, Mass., containing remarks on Mr. Erman's discussion of the orbits of the periodical meteors, and an investigation of their perturbations; which was read, and referred to a committee.

Professor Bache read an extract from a letter of Major Sabine, stating that the changes of magnetic declination, and of horizontal force, would be observed on the term days, with transportable magnetometers furnished by the British Association, by Mr. Schomberg, at Demarara, in Guiana; this being the first magnetic station yet established in South America.

Professor Bache also stated, that he had received from Mr. Bond, abstracts of the term day observations of changes of magnetic declination at Cambridge, Mass., for the months of June, July, August and September: also, that he had received from Lieut. Gilliss, of the U. S. Navy, observations of declination made at Washington, from the 5th to the 9th of January, inclusive, from 9 to 10 A. M. of Göttingen time at short intervals, for comparison with similar observations at Philadelphia and Toronto. These observations he proposes, when compared with those at the Philadelphia Magnetic Observatory, to communicate to the Society.

Dr. Horner requested that a correction should be made in his communication, "On the Dental System of the Mastodon,"

now in the Society's press, and in the abstract which was published in the Proceedings of December 4, 1840 (Vol. I. p. 308). Dr. Horner said, that on a re-examination of the paper of Dr. Godman, in the 3d volume of the Transactions, he was satisfied that the example there figured and described, was in fact the upper jaw of the Tetracauledon.

Professor Bache communicated a letter, from Mr. Rümker, director of the Observatory at Hamburg, giving the positions of a new comet discovered in the constellation Draco, by Mr. Bremiker of Berlin, as observed at Berlin, October 17 and 18, and at Hamburg, October 31, and November 1.—The observations given in the letter are later by two days than those given in the last number yet received here, of Schumacher's Astronomische Nachrichten.

Mr. Walker mentioned the decease of Mr. Ebenezer Porter Mason, at Richmond, Va., on the 26th ult., in the 22d year of his age. Mr. Walker referred briefly, but in terms of high praise, to the astronomical labours of Mr. Mason, and especially to those connected with nebulæ, and double stars, the results of which are recorded in the Society's Transactions.

In the spring of 1840, Mr. Mason commenced a series of observations on double stars, with the 10 feet Dollond's refractor, at Yale College, and thus laid the foundation of that fatal disease, consumption, to which he fell an early victim. From his own measurement, together with those previously published, he computed on Herschell's method, an orbit for the remarkable pair of stars γ Virginis, having a period of about 171 years; which orbit gives their position conformably, within a small fraction of a degree, to the most recent measurements of Struve and Kaisar, at the Pulkova, and Leyden observatories, received since Mr. Mason's decease. The first ellipses computed for this binary system by the younger Herschel, about the year 1830, of 550 and 660 years, differ from recent observations nearly 20°. The ephemeris of Mr. Mädler, of the Berlin observatory, computed in 1838, from his ellipse with a period of 158 years, differs 8° from their present position.

Under a belief that exercise might restore his health, Mr. Mason accepted an appointment as astronomical observer in Professor Renwick's department of the northeastern boundary exploration of last summer. But his disease was already fixed; and it terminated, at the early age of 21, a life devoted for the last five years to the cultiva-

tion of practical astronomy, with a zeal and success hitherto without a parallel in this country.

Dr. Patterson, on behalf of the Committee on the Observatory, called the attention of the Society to two plans and elevations of the proposed building, which had been prepared by Mr. Strickland.

After some conversation on the subject of the omission, by some of the members elect, to sign the laws, agreeably to a provision contained in the first chapter of them, it was on motion of Dr. Chapman,

Resolved, that the Secretaries be instructed to report, whether any, and what measures are necessary, to secure conformity on the part of members elect, residing within ten miles of the Hall, to the provision which requires them to sign the laws in the course of the year immediately succeeding their election.

Dr. Bache, on behalf of the Secretaries, announced that they had appointed Mr. Kane, one of their number, to be Reporter of the Society's Proceedings for the year 1841.

Mr. John Vaughan was re-elected Librarian.

The following standing committees were appointed for the year.

Of Finance.—Mr. C. C. Biddle, Mr. Ord, Dr. Patterson.

Of Publication.—Mr. Lea, Dr. Hays, Mr. Fisher.

On the Hall.—Mr. Strickland, Mr. Kane, Mr. Vaughan.

On the Library.—Mr. Ord, Dr. Hays, Mr. Campbell.

Agreeably to a provision of the laws, the list of surviving members of the Society was read. It appeared that the number of members at this time is 327; of whom 227 reside in the United States, and 100 in foreign countries.

The following gentlemen were then elected members of the Society:—

The Chevalier Bernardo Quaranta, of Naples.

David Irvin, of Madison, Wisconsin Territory.

Doctor Adolph Carl Peter Callisen, of Copenhagen.

William Rawle, of Philadelphia.

Rev. Benjamin Dorr, of Philadelphia.

John A. Stephens, of New York.

Tobias Wagner, of Philadelphia.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. FEBRUARY, 1841. No. 16.

Stated Meeting, February 5.

Present, forty-two members.

Mr. DU PONCEAU, President, in the Chair.

Letters were read from the Rev. Dr. Dorr, and from William Rawle, Esq., acknowledging the honour done them by their election to membership,—from the Secretary of the Philosophical Society of Cambridge, England, dated 19 Nov. 1840, acknowledging the receipt of the Transactions, Vol. III. and Vol. VII. Part 1,—from the Secretary of the Geological Society of London, dated 5 Nov. and 19 Nov., 1840, acknowledging the receipt of the Society's Proceedings, Vol. I. Nos. 11 and 12, and of the Transactions, Vol. VII. Part 1.

The following donations were received:—

FOR THE LIBRARY.

Éloges Historiques d'Antoine-Laurent de Jussieu, de R. L. Desfontaines, de J. Jul. de Labillardière, et de F. Cuvier; par M. Flourens, Secrétaire perpétuel &c.—*From the Author.*

Discourse on the Objects and Importance of the National Institution for the Promotion of Science, established at Washington, 1840, delivered at the first anniversary; by Joel R. Poinsett, Secretary of War, and Senior Director of the Institution.—*From the Institution.*

American Quarterly Register, conducted by B. B. Edwards and W. Cogswell, February, 1841. Vol. XIII, No. 3.—*From Mr. Cogswell.*

Bibliotheca Americana, being a choice Collection of Books, relating to North and South America and the West Indies, including Voyages to the Southern Hemisphere, Maps, Engravings and Medals. 8vo. Paris, 1840.—*From Mr. D. B. Warden.*

The American Medical Library and Intelligencer, &c., by Robley Dunglison, M.D., &c., Dec. 15, 1840.—*From Dr. Dunglison.*

Sketches Historical and Descriptive of Louisiana, by Major Amos Stoddard, Member of the U. S. M. P. S., &c. 8vo. Philadelphia, 1812.—*From Mr. Du Ponceau.*

Sundry Pamphlets in relation to Louisiana. 8vo.—*From the same.*

Proceedings of the Royal Astronomical Society. Vol. V. No. 9. Nov. 13, 1840.—*From the Society.*

Tal uti Kongl. Vetenskaps-academien vid öppnandet af dess Allmänna Sammanträde den 31 Mars, 1838, af Præses Herr C. J. Ekströmer, &c.—*From the Society.*

Aors-Berättelse om Botaniska Arbeten och Upptäckter för Aor 1837, &c., af Joh. Em. Wikström. 8vo. Stockholm, 1839.—*From the same.*

Kongl. Vetenskaps-Academiens Handlingar för Aor, 1838. 8vo. Stockholm, 1839.—*From the same.*

Aors-Berättelse om Technologiens framsteg till Kongl. Vetenskaps-Academien afgiven den 31 Mars, 1838, af G. E. Pasch.—*From the same.*

Tal om Juridisk Statistik och grunderne för Lagstiftningen, haollet uti Kongl. Vetenskaps-Academien vid Præsidii nedläggande den 8 April, 1840, af Grefve M. Rosenblad, &c. 8vo. Stockholm, 1840.—*From the same.*

Tal om K. Seraphimer-Ordens Lazarettet i Stockholm haollet i Kongl. Vetenskaps-Academien vid Præsidii nedlaggände d. 7 Apr. 1838, af Dr. C. J. Ekströmer, &c. 8vo. Stockholm, 1840.—*From the same.*

Professor Bache, from the Committee, consisting of Prof. Bache, Mr. Walker, and Mr. Cresson, on the paper of Mr. Redfield presented at the last meeting, entitled "Observations on the Storm of December 15, 1839," read a letter from that gentleman, and reported in favour of publishing the paper in the Transactions. The publication was ordered accordingly.

The Committee, consisting of Mr. Nicklin, Dr. Griffith and Dr. Hays, to whom was referred a paper entitled "Description of Nineteen New Species of Colimacea, by Isaac Lea," report-

in favour of its publication in the Transactions; which was ordered accordingly.

Descriptions of these New Species were published in the Proceedings of February, 1840.

The same committee, to whom was also referred a paper entitled "Continuation of Mr. Lea's paper on New Fresh Water and Land Shells," reported in favour of its publication in the Transactions of the Society; and it was ordered accordingly.

In this paper Mr. Lea describes fifty-seven new species of the genus Melania. He notices the existence of numerous species distributed over a wide geographical range, from the Columbia River to the St. Lawrence; there being now about 117 species included in the Fauna of the United States.

This genus having become so extended, Mr. Lea felt the necessity of making minor groupes, and has therefore proposed nine sections. 1 The Smooth. 2 The Plicate. 3 The Carinate. 4 The Sulcate. 5 The Striate. 6 The Tuberculate. 7 The Granulate. 8 The Cancellate. 9 The Spinose.

SECTION 1.—SMOOTH MELANIÆ.

Melania Hildrethiana. Testâ fusiformi, subcrassâ, lævi, corneâ; spirâ brevi, mucronatâ; suturis valdè impressis; anfractibus quinis, convexis; aperturâ magnâ, ovatâ, infernè angulatâ, vel albâ vel purpureâ. *Hab.* Ohio River, near Marietta.—*Dr. Hildreth.*

Melania castanea. Testâ clavæformi, subtenui, lævi, tenebroso-castaneâ; spirâ elevatâ, prope apicem carinatâ; suturis parvis; anfractibus octonis, convexiusculis; aperturâ parvâ, ellipticâ, purpureâ. *Hab.* Maury County, Tenn. *Mr. Dutton.*

Melania lævigata. Testâ obtuso-conicâ, subtenui, lævi, nitidâ, luteolâ; spirâ breviusculâ, prope apicem carinatâ; suturis linearibus; anfractibus septenis, subconvexis; aperturâ sub-grandi, ellipticâ; infernè angulatâ, albidâ. *Hab.* Alabama River, at Claiborne.—*Judge Tait.*

Melania Kirtlandiana. Testâ acuto-conicâ, sub-crassâ, lævi, nitidâ, corneâ; spirâ elevatâ, prope apicem carinatâ; suturis impressis; anfractibus novenis, subconvexis; aperturâ parvâ, ellipticâ, albidâ. *Hab.* Richmond, Indiana; Duck Creek, near Cincinnati; and Miami, Ohio.—*T. G. Lea.* Little Miami, *Dr. Warder.*

Melania Taitiana. Testâ conoideâ, subtenui, lævi, nitidâ, corneâ; spirâ decisâ, ad apicem carinatâ; suturis impressis; anfractibus subconvexis; aperturâ parvâ, ellipticâ, infernè subangulatâ, albidâ. *Hab.* Alabama River, at Claiborne.—*Judge Tait.*

Melania dubia. Testâ conoideâ, subtenui, lævi, corneâ; spirâ subelevatâ; suturis linearibus; anfractibus septenis, subconvexis; aperturâ ellipticâ, parvâ, infernè subangulatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania ebenum. Testâ obtuso-conoideâ, crassâ, lævi, nigrâ; spirâ obtusâ; suturis parvis; anfractibus subconvexis; aperturâ subgrandi, ovata, infernè subangulatâ, intus purpuratâ. *Hab.* Robinson County, Tenn.—*Dr. Currey.*

Melania rufa. Testâ turritâ, subtenui, lævi, nitidâ, tenebroso-rufâ; spirâ elevatâ; suturis impressis; anfractibus convexis, superioribus carinatis; aperturâ parvâ, elliptieâ, infernè subangulatâ, intus purpuratâ. *Hab.* Mamma's Creek, Tenn.—*Mr. S. M. Edgar.*

Melania fusiformis. Testâ fusiformi, subtenui, luteâ, mucronatâ, lævi; spirâ brevi; suturis linearibus; anfractibus senis, ultimo magno et inflato, aperturâ ovato-productâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania clavæformis. Testâ clavæformi, subtenui, castaneo-fuscâ, lævi, nitidâ; spirâ acutâ; suturis subimpressis; anfractibus octonis, convexis; aperturâ productâ, pallido-purpureâ. *Hab.* Ocoee District, Tenn.—*Dr. Troost.*

Melania gracilis. Testâ clavæformi, subtenui, corneâ, lævi; spirâ acutâ; suturis impressis, anfractibus octonis convexis; aperturâ parvâ, ovatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania subsolida. Testâ subfusiformi, subsolidâ, corneâ, lævi; spirâ acutâ; suturis impressis; anfractibus subconvexis; aperturâ subproductâ, intus purpureâ. *Hab.* Tenn.—*Dr. Troost.*

Melania Ococensis. Testâ conoideâ, subcrassâ, tenebroso-corneâ, lævi; spirâ obtusâ, apud apicem lineis notatâ; suturis impressis; anfractibus subconvexis; aperturâ parvâ, ovatâ, cæruleâ. *Hab.* Ocoee District, Tenn.—*Dr. Troost.*

Melania subcylindracea. Testâ subcylindraceâ, subcrassâ, corneâ, lævi; spirâ obtuso-elevatâ; suturis impressis; anfractibus convexis; aperturâ parvâ, ovatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania sordida. Testâ conoideâ, subcrassâ, tenebroso-corneâ, lævi; suturis impressis; anfractibus subconvexis; aperturâ subgrandi, subrotundâ, cæruleâ. *Hab.* Tenn.—*Dr. Troost.*

Melania regularis. Testâ conoidcâ, subcrassâ, tenebroso-corneâ, lævi; spirâ elevatâ; suturis subimpressis; anfractibus planulatis; aperturâ parvâ, albidâ. *Hab.* Ocoee District, Tenn.—*Dr. Troost.*

Melania fuliginosa. Testâ fusiformi, subinflatâ, subcrassâ, tenebroso-fuscâ, lævi; spirâ obtusâ; suturis impressis; anfractibus senis, subconvexis; aperturâ magnâ; ad basim angulatâ et canaliculatâ. *Hab.* Big Bigby Creek, Maury Co. Tenn.—*Mr. Dutton.*

Melania Nicklinianа. Testâ subelevatâ, solidâ, valdè tenebrosâ, lævi; suturis impressis; anfractibus senis, subconvexis; aperturâ magnâ, subrotundâ, intus purpuratâ. *Hab.* Bath County, Va.—*P. H. Nicklin.*

Melania viridis. Testâ subfusiformi, subcrassâ, viridi, lævi; spirâ brevi, obtuso-conoideâ; suturis linearibus; anfractibus quinis subconvexis; aperturâ ovatâ, subgrandi, albâ. *Hab.* Vicinity of Cincinnati.—*T. G. Lea.*

Melania occidentalis. Testâ subglobosâ, subcrassâ, viridi lævi; spirâ brevi, mucronatâ; suturis linearibus; anfractibus quaternis subconvexis; aperturâ ovatâ; magnâ, intus vel purpureâ vel albâ. *Hab.* Vicinity of Cincinnati, Ohio. *T. G. Lea.*

Melania Niagarensis. Testâ obtuso-conicâ, crassâ, lævi, corneâ; spirâ brevi; suturis linearibus; anfractus subplanulatis; aperturâ subgrandi, ellipticâ, intus purpureâ. *Hab.* Falls of Niagara.

Melania globula. Testâ subglobosâ, lævi, tenebroso-fuscâ, fasciatâ: spirâ

brevi; suturis impressis; anfractibus quaternis, subconvexis; aperturâ magnâ, subrotundâ, intus cœruleâ. *Hab.* Tennessee.—*Dr. Troost.*

Melania altilis. Testâ subglobosâ, crassâ, lævi, pallido-corneâ; spirâ brevi; suturis parvis; anfractibus quaternis, supernè subangulatis; aperturâ magnâ, subrotundâ, albâ. *Hab.* Susquehanna River, Md.

Melania strigosa. Testâ turrito acutâ, tenui, pallido-luteâ, lævi, supernè striatâ; spirâ exserta; suturis impressis; anfractibus novenis, planulatis; aperturâ parvâ, clliptică, ad basim angulatâ, intus cœruleâ. *Hab.* Tennessee.—*Dr. Troost.*

Melania virgata. Testâ subrotundâ, subtenui, luteâ, bifasciatâ, lævi, nitidâ, spirâ brevi; suturis linearibus; anfractibus convexis; aperturâ magnâ, clliptică, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania tenebrosa. Testâ conoideâ, subcrassâ, subnigrâ, lævi; spirâ subelevatâ; suturis impressis; anfractibus planulatis; aperturâ subgrandi, ellipticâ, ad basim angulatâ, intus cœruleâ. *Hab.* Tenn.—*Dr. Troost.*

Section 2.—Plicate Melaniæ.

Melania teres. Testâ acuto-turritâ, tenui, corneâ, plicatâ; spirâ exsertâ; suturis impressis; anfractibus novenis, convexis; aperturâ parvâ, ellipticâ, intus albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania obtusa. Testâ fusiformi, subcrassâ, plicatâ, corneâ; spirâ obtusâ; suturis impressis; anfractibus quaternis, ultimo semi-plicato; aperturâ magnâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania Lecontiana. Testâ conoideâ, crassâ, plicatâ, corneâ; spirâ obtuso-elevatâ; suturis parvis; anfractibus senis, planulatis; aperturâ magnâ, ellipticâ cœruleâ. *Hab.* Georgia.—*Major Le Conte.*

Melania corrugata. Testâ conoideâ, subtenui, diaphanâ, plicatâ, transversè striatâ, corneâ; spirâ subelevatâ; suturis valdè impressis; anfractibus septènis, convexis, supernè cancellatis; aperturâ subgrandi, ellipticâ, infra angulatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania monozonalis. Testâ fusiformi, subcrassâ, plicatâ, fasciatâ, pallidâ; spirâ obtusâ; suturis linearibus; anfractibus quinis, sub-convexis; aperturâ magnâ, ellipticâ, infrà angulatâ, albâ. *Hab.* Tenn.—*Dr. Troost.*

Melania terebralis. Testâ acuto-turritâ, sub-tenui, plicatâ, nitidâ, rufo fuscâ; spirâ valde elevatâ; suturis valdè impressis; anfractibus novenis, convexis, supernè carinatis; aperturâ parvâ, clliptică, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania columella. Testâ conoideâ, subtenui obscuro-plicatâ, corneâ; spirâ subelevatâ, prope apicem striatâ; suturis impressis; anfractibus senis, subconvexis; aperturâ parvâ, ellipticâ, infernè angulatâ, albidâ. *Hab.* Tennessee.—*Dr. Troost.*

Melania blanda. Testâ conoideâ, subtenui, plicatâ, nitidâ, corneâ; spirâ subelevatâ, prope apicem striatâ; suturis impressis; anfractibus septenis, subplanulatis; aperturâ parvâ, ellipticâ, infernè angulatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania crebri-costata. Testâ conoideâ, subcrassâ, crebri-plicatâ, corneâ; spirâ elevatâ; suturis linearibus; anfractibus septenis, planulatis; aperturâ parvâ, clliptică, infernè angulatâ, cœrulea. *Hab.* Robinson County, Tenn. *Dr. Currey.*

Melania Curreyana. Testâ conoideâ, subcrassâ, plicatâ, corneâ; spira sub-

elevatâ; suturis irregulariter impressis; anfractibus septenis, subconvexis; aperturâ parvâ, infernè angulatâ, intus purpuratâ. *Hab.* Barren River, Ky. *Dr. Currey.*

Melania Edgariana. Testâ conoideâ, subtenui, plicatâ, striatâ, luteo-fuscâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus octonis, subplanulatis; aperturâ parvâ, ellipticâ, infernè angulatâ, cœruleâ. *Hab.* Cany Fork, Tenn.—*Mr. S. M. Edgar.*

Melania decora. Testa turrito-acutâ, sub-tenui, plicatâ, cornea, supernè striatâ; spirâ acutâ, elevatâ; suturis impressis; anfractibus novenis, subplanulatis; aperturâ, parvâ, ellipticâ, albidâ. *Hab.* Tennessee—*Dr. Troost.*

Melania costulata. Testâ conoideâ, subtenui, luteâ, plicatâ, supernè carinatâ; spirâ subproductâ; suturis impressis; anfractibus novenis, subconvexis; aperturâ parvâ, subovatâ, intus cœruleâ. *Hab.* Barren River, Kentucky.—*Dr. Currey.*

Melania nitida. Testâ subobtusâ, suberassâ tenebroso, fuseâ, plicatâ; spirâ obtusâ; suturis impressis; anfractibus septenis, subconvexis; aperturâ parvâ, ellipticâ, ad basim angulatâ, intus subrufâ. *Hab.* Tenn.—*Dr. Troost.*

Melania plicatula. Testâ conoideâ, subelevatâ, tenui, tenebroso-corneâ, plicatâ; spirâ subelevatâ; suturis impressis, anfractibus octonis, subconvexis, superne striatis; aperturâ parvâ, ellipticâ, ad basim subangulatâ, intus albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania concinna. Testâ turrrito-acutâ, subtenni, fuscâ, plicatâ; spirâ exsertâ; suturis impressis; anfractibus novenis, carinatis, planulatis; aperturâ parvâ, ellipticâ, ad basim angulatâ, intus albidâ. *Hab.* Tenn.—*Dr. Troost.*

Section 3.—Carinate Melaniæ.

Melania Babylonica. Testâ turritâ, suberassâ, carinatâ; spirâ subelevatâ, prope apicem striatâ; suturis impressis; anfractibus septenis, supernè angulatis; aperturâ subgrandi, elliptieâ, albâ. *Hab.* Yellow Springs, Green Co., Ohio.—*T. G. Lea.*

Melania exarata. Testâ conieâ, suberassâ, nigrâ carinatâ; suturis exaratis; anfractibus planulatis, carinatis; aperturâ parvâ, ad basim angulatâ et canieulatâ, intus tenebrosâ. *Hab.* Tenn.—*Dr. Troost.*

Melania Potosiensis. Testâ conoideâ, subtenui, carinatâ, fuseâ; spirâ obtuso-elevatâ; suturis valdè impressis; anfractibus octonis, convexis; aperturâ magnâ, ovatâ, purpuratâ. *Hab.* Potosi, Missouri.—*Dr. Troost.*

Melania acuto-carinata. Testâ conoideâ, sub-crassâ, carinatâ, nitidâ, tenebroso-fuscâ; spirâ obtuso-elevatâ; suturis impressis; anfractibus senis; apertura sub-grandi, elliptieâ, infernè angulatâ, intus purpuratâ. *Hab.* Tenn.—*Dr. Currey.*

Melania Warderiana. Testâ clavæformi, suberassâ, tenebrosâ; spirâ conicâ, carinatâ; suturis linearibus; anfractibus octonis, convexis; aperturâ ovatâ, subgrandi, intus carneâ. *Hab.* Cedar Creek, a branch of Clinch River, Russell Co., Va.—*J. A. Warder, M.D.*

Section 4.—Sulcate Melaniæ.

Melania sulcosa. Testâ conoideâ, crassâ, longitudinaliter sulcatâ, luteolâ; suturis impressis; anfractibus planulatis; aperturâ parvâ, ovatâ, albidâ. *Hab.* Tenn.—*Dr. Troost.*

Section 5.—Striate Melaniæ.

Melania striata. Testâ conoideâ, subtenui, tenebroso-fuscâ, striatâ, plicatâ, supernè carinatâ; spirâ subelevatâ; suturis impressis; anfractibus octonis, convexis; aperturâ parvâ, ellipticâ, intus subrufâ. *Hab.* Tenn.—*Dr. Troost.*

Melania pilula. Testâ subglobosâ, crassâ, striatâ, tenebroso-fuscâ; suturis sub-impressis; anfractibus convexis aperturâ, ovatâ, magnâ, infra subangulatâ, intus purpuratâ. *Hab.* Tenn.—*Dr. Troost.*

Melania circincta. Testâ turritâ, subtenui, pallido-luteâ, fasciatâ, supernè striatâ; spirâ exsertâ; suturis parvis; anfractibus novenis, subconvexis, in medio carinatis; aperturâ subparvâ, ellipticâ, ad basim angulatâ, intus albâ. *Hab.* Tenn.—*Dr. Troost.*

Section 6.—Tuberculate Melaniæ.

Melania venusta. Testâ fusiformi, subtenui, luteolâ, supernè subtuberculatâ; spirâ subobtusâ; suturis rugoso-impressis; anfractibus senis, convexis; aperturâ productâ, ad basim angulatâ et canaliculatâ, intus albidâ. *Hab.* Tenn.—*Dr. Troost.*

Melania Florentiana. Testâ ellipticâ, ponderosâ, pallidâ tuberculata; spirâ obtusâ; suturis impressis; anfractibus senis, subconvexis; aperturâ productâ, albidâ. *Hab.* Tennessee River, Florence, Alabama.—*Mr. Dutton.*

Melania Duttoniana. Testâ fusiformi, subcrassâ, luteolâ, fasciatâ, tuberculatâ; spirâ elevatâ, ad apicem acutâ; suturis enormiter linearibus; anfractibus septenis, supernè depressis; aperturâ productâ, ad basim angulatâ, et canaliculatâ, intus albidâ. *Hab.* Waters of Tennessee.—*Dr. Troost.* Duck River, Maury Co. Tenn.—*Mr. Dutton.*

Section 7.—Granulate Melaniæ.

Melania Holstonia. Testâ conoideâ, subcrassâ, nigrâ, granosâ; spirâ subelevatâ; suturis impressis; anfractibus supernè planulatis; aperturâ ovatâ, purpureâ. *Hab.* Tennessee.—*Dr. Troost.* Holston River, Tenn.—*Mr. S. M. Edgar.*

Section 8.—Cancellate Melaniæ.

Melania caliginosa. Testâ conoideâ, subcrassâ, cancellatâ, transversè striatâ, tenebroso-fuscâ; spirâ elevatâ; suturis irregulariter impressis; anfractibus octonis, sub-convexis; aperturâ parvâ, ellipticâ, intus purpuratâ. *Hab.* Tenn.—*Dr. Troost.*

Melania nodulosa. Testâ conoideâ, crassâ, cancellatâ, tenebroso-fuscâ; suturis irregulariter impressis; anfractibus sub-convexis; aperturâ subgrandi, ellipticâ, infrâ subangulatâ, intus cœruleâ. *Hab.* Tenn.—*Dr. Troost.*

Dr. Patterson read a communication, entitled "Psychological Observations on the Siamese Twins, Cheng and Eng, made in 1836, by Professor George Tucker, of the University of Virginia;" which was referred to a committee.

Professor Bache presented to the notice of the Society observations of magnetic declination received from Mr. Bond, which had been made by that gentleman during six days, com-

mencing on the 4th of January, in concert with the Magnetic Observatories at Philadelphia, Washington and Toronto.

Mr. Du Ponceau remarked, that the Indian MS. found on the coast of Labrador, of a part of which he presented a fac simile at the last meeting, is in a dialect of the Algonquin or Chippeway language. He thought it desirable that the Philosophical and Literary Society of Quebec should publish the whole, with the French translation, in their Transactions.

Mr. Du Ponceau directed the attention of the Society, especially of those devoted to the study of Natural Science, to the Eulogiums of the younger Jussieu, Desfontaines, Labillardière, and the younger Cuvier, by M. Flourens, presented to the Society this evening.

Mr. Du Ponceau entered at some length into the organization and internal arrangements of the French Institute, and of some other learned Societies of Paris, established since the beginning of the present century, called free societies, (sociétés libres,) such as the Asiatic, Geographical, Antiquarian, Statistical, &c., with most of which this Society is in correspondence.

Professor Bache deposited in the Society's archives, as a document connected with its history, the original engagement of the Society, in the year 1787, under its official seal and the signatures of the Vice Presidents and Secretaries, to repay to Dr. Franklin the then President such sums of money as he should advance, in addition to his several donations, for completing the Hall of the Society, agreeably to an offer which he had made.

The Library Committee, to whom was referred a letter from M. de Candolle, proposing to exchange the work now publishing at Geneva by the Society of Natural History, &c., for the Transactions of this Society, reported in favour of the proposed exchange; and the Committee was thereupon instructed to carry it into effect.

Dr. Hays, from the Committee of Publication, reported that the 2d Part of Vol. VII. of the Society's Transactions, is now ready for distribution.

Mr. Kane, Reporter, presented copies of the Proceedings of the Society, Vol. II. No. 15, for January, 1841.

Stated Meeting, February 19.

Present, thirty-two members.

Mr. Du Ponceau, President, in the Chair.

Letters were read—

From the Secretary of the London Society of Antiquaries, dated 20 Nov., 1840, acknowledging the receipt of Vol. VII. Part 1, of the Transactions, and of Nos. 11 and 12 of the Proceedings of this Society.

From His Excellency, the French Minister, M. de Bacourt, dated Washington, 29 Jan., 1841, presenting to the Society a copy of the new edition of the Dictionary of the French Academy.

From Mr. William B. Wood, of Philadelphia, dated 17 Feb., 1841, presenting to the Society a volume of the Canton Register, edited by his son, Mr. Wm. W. Wood, the first newspaper printed in the Empire of China in the English language.

From Mr. David B. Warden, dated Paris, 22 Dec., 1840, in relation to certain works ordered by him for the Society.

The following additions to the Library were announced:—

BY DONATION.

Transactions of the Horticultural Society of London. Second series. Vol. II. Part 5. 4to.—*From the Society.*

Philosophical Transactions of the Royal Society of London, for the year 1840. Part 2. 4to.—*From the Society.*

Proceedings of the Royal Society. Nos. 41 to 44 inclusive, 1839–1840. 8vo.—*From the same.*

Proceedings of the Horticultural Society of London. Nos. 7 and 8. *From the Society.*

List of the Horticultural Society of London, corrected to 12 August, 1840.—*From the same.*

Proceedings of the Numismatic Society of London. 1838–39.—*From the Society.*

Dictionnaire de l'Académie Française. Sixième Édition. 2 Vols. 4to. Paris, 1835.—*From H. E. Ad. de Bacourt, Minister Plenipotentiary of France.*

Congressional Documents. 26th Congress, 2d Session. Doc. No. 2. 8vo. Dec., 1840.—*From Hon. G. W. Toland.*

The American Medical Library and Intelligencer. Vol. 4, No. 19. Jan., 1841. By Robley Dunglison M.D. &c. &c.—*From the Editor.*

Institut Royal de France. Rapport des Séances Publiques Annuelles des Cinq Académies. Mai, Juin, Juilliet, 1840. 7 Nos. 4to.—*From Mr. Warden.*

History of the Federal Government, for Fifty Years, from March 1789, to March 1839. By Alden Bradford, LL.D. &c. 8vo. Boston, 1840.—*From the Author.*

Historical View of the Literature of the South of Europe, by J. C. L. Simonde de Sismondi, &c., Translated from the Original, with Notes, by Thomas Roscoe, Esq. 2 Vols. 8vo. New York, 1827.—*From Mr. Vaughan.*

The Canton Register, Canton, Nov. 8, 1827, to Dec. 13, 1828 inclusive. Fol.—*From Mr. William B. Wood.*

BY PURCHASE AND EXCHANGE.

The Edinburgh New Philosophical Journal, conducted by Professor Jameson. Oct., 1840 to Jan., 1841, inclusive. 8vo.

The London and Edinburgh Philosophical Magazine and Journal of Science, by Sir David Brewster, Richard Taylor, and Richard Phillips. 3d Series, No. 101. Feb., 1840. 8vo.

The Magazine of Natural History, and Journal of Zoology, &c. &c. conducted by J. C. Loudon. No. 1, May, 1828. No. 6, March, 1829. No. 13, May, 1830. No. 17, Jan., 1831. No. 25, April, 1832. No. 26, May, 1832. No. 27, June, 1832. No. 30, Nov., 1832. No. 42, Oct., 1834. 8vo.

The Nautical Almanac and Astronomical Ephemeris, for 1843. 8vo.

Journal Asiatique, ou Recueil de Mémoires, &c. 3me Sér. Tome 10. No. 53, Juillet, 1840. No. 54, Août 1840. 8vo.

Journal Général de la Littérature de France. 43me ann. Cah. 7, 8. Juillet, Août. 8vo.

Annales de Chimie et de Physique. Mar., Avr., Mai, Juin, Juill., Août, Sept., 1840. 8vo.

Comptes rendus hebdomadaires des séances de l'Académie des Sciences, &c. 1r Sem., 1840, Nos. 2 to 26 inclusive, and 2me Sem., Nos. 1 to 17 inclusive. 4to.

The Committee, consisting of Mr. Nulty, Dr. Patterson, and Professor Vethake, to whom Mr. Walker's paper, entitled, "Researches concerning the Periodical Meteors of August and

November," had been referred, reported in favour of its publication in the Transactions; which was thereupon ordered.

The paper contains—1st, Tabular statements of the relative velocities derived from corresponding observations of the same meteor at different stations, chiefly from Quetelet's Catalogue. 2d. A catalogue of remarkable appearances of shooting stars, also from Quetelet, with additions. 3d. Bessel's position of the earth, in the ecliptic at the date of the principal November showers. 4th. The convergent points hitherto observed for the relative paths of the meteors of August, and—5th. Of those of November. The term *periodical* is restricted to the meteors, which, at a particular season of the year, tend towards the convergent point for that season. *Sporadic* is applied to the unconformable meteors seen on the same occasions. *Extraordinary* showers of the second table are placed in the former class, and are considered as differing from periodical meteors only in numbers. The convergent point, as far as noticed for the periodical meteors, is not far from the antipode of the earth's *tangential* direction. The average relative velocities in table first, with the known convergent points, for August and November, and other parts of the year, as far as observed, afford on the cosmical theory, the most plausible estimate of the elliptic elements of the orbit of periodical meteors. The well-known formulæ for computing these elements are stated; and the differential formulæ are investigated for computing the probable errors of such elements, arising from errors of the relative velocities and directions derived from the foregoing tables. The most plausible elements of the periodical meteors, are thus found to have their perihelia inferior to that of Mercury, and hence are only seen by us when near their apheiia; the orbits being necessarily very eccentric, or flattened, and their inclinations very great. Since many millions of these bodies are annually encountered by the earth, including chiefly those which move in orbits having small parameters, analogy leads to the inference, that the planetary spaces inferior to Venus, abound in these bodies, of which only a small proportion ever reach the earth's mean distance, or become visible to us. This suggestion of a far greater aggregation of these bodies near the sun, is supported by the analogy of the resisting medium encountered by Encke's comet, which is only sensible at a distance from the sun below that of Venus. Bessel's objections to the theory of the resisting medium, that it is indicated by no other phenomenon in nature, may be in some degree obviated by this analogy; since a very thin, light body, might be sensibly resisted

by a great multitude of these small meteors or asteroids, though their effect is insensible on Mercury and the other primaries, owing to their superior mass and density, and as Encke remarks, also insensible on Halley's and Biela's comets, whose perihelion distances, respectively, correspond nearly with those of Venus and the earth. It is only necessary to suppose that in some planes these bodies exhibit a greater tendency to the formation of clusters, or possibly of flattened rings, in order to account for anniversary periods of remarkable showers; since the earth revisiting the same plane at the same season of the year, and at the same distance from the sun, may or may not encounter one of these clusters or parts of a flattened ring. But these clusters continuing to move in the same plane, the earth must, if it meet them at all, do so at anniversary periods. On the supposition of a flattened ring, the node having the same radius vector as the earth, these displays might occur for several anniversaries, and then cease for an indefinite period, owing to the motion of the apsides of the ring; till the anomaly which has a radius vector equal to the earth's mean distance, again coincides with one of the nodes of the ring. Hence the connexion between the periods of the second table, as far as regards our knowledge of them is *accidental*, since they depend not on the orbital period of these bodies round the sun, but on the circumstance of the earth's encountering one of these clusters, or planes abounding in them, which is regulated by a law of distribution of these bodies in planetary space, that must always remain unknown, for want of data for its determination.

The author conjectures that the meteors termed *sporadic*, by Quetelet, which have no common convergent point, may have their perihelia superior to those of the periodical meteors, and their aphelia far superior to that of the earth. In such a case, their orbital velocity would be as great as that of the earth, or greater; and as they move in all varieties of direction, the earth's tangential motion does not cause them to tend, relatively towards a convergent point, in nearly an opposite direction, as it does with meteors moving very slowly in their orbits, whatever may be their true directions in space.

A brief history of the opinions and theories of writers on this subject is given; and an oversight pointed out in Professor Erman's paper, quoted by the author in an oral communication of August 21st, 1840. This relates to Prof. Erman's minimum relative velocity of the meteors, which, instead of being 0.83, of that of the earth, may be indefinitely small, and therefore, in his formulæ [Astronomische Nachrichten, No. 385, p. 9,] may give a motion of the convergent point indefi-

nitely great. The author also remarks, that the quantities neglected in Prof. Erman's formulæ for this motion, may produce an important effect on the result, and even change its direction from a retrograde motion, as found by Prof. Erman, to a direct motion as observed by Mr. Fitch, at New Haven, and as indicated by Prof. Forshey's observed positions of this point at two different dates on the night of 10th August last. A slight anachronism is also mentioned in Mr. Walker's oral communication, Mr. Herrick having called the attention of observers to the August period, *after* the display of 1837, instead of *before*; Mr. H. having made no observations that year himself, but having reported the convergent as observed about 30 degrees from the pole in the Camelopard, by Mr. Shaeffer, of New York.

The same committee, to whom had been referred a communication from Professor Pierce, of Cambridge, Mass., containing remarks on Mr. Erman's discussion of the orbits of the periodical meteors, and an investigation of their perturbations, reported in favour of publishing the communication in the Transactions; and its publication was thereupon ordered.

The paper has reference to the earth's attractive force in increasing the relative velocity of a meteor approaching near its surface. The formulæ employed are those of the Méc. Cél., Vol. IV., Book 9, Chap. 2; the meteor being at the time within the earth's sphere of activity, the radius of which is 0.0053 in units of the earth's mean distance, the actual radius vector being 0.0057, for the date in question, August 10th, 1839. The notation is that of Prof. Erman, Jr., in Schumacher's Astr. Nachr., No. 385. If v'^2 denote the meteor's relative velocity in its elliptic orbit round the sun, according to the cosmical theory adopted by Professor Erman, then according to Professor Pierce, the square of the actual relative velocity increased by the earth's attraction is, $v_1'^2 = v'^2 + 0.13932$, in units of the earth's true tangential velocity. Professor Erman, having comprised within certain limits the possible true and relative velocities of the meteors, from the sun's central force; these, together with the increased relative velocity, are thus pointed out. The author, however, states, that Prof. Erman's minimum limit of the relative velocity is adopted on insufficient ground, owing to the rejection of one of the two roots of an equation of the second degree, where both roots are possible. A similar remark is applied to Prof. Erman's limits for the inclinations and other elements of the meteor's orbits. The author then gives the reasons which tend to show that the actual rela-

tive velocity is below Prof. Erman's minimum limit. Thus, in the instance of the meteors of August 10th, the average discrepancy of any single meteor's relative direction, from the common convergent point, is, according to Prof. Erman, more than 10°, and must have a maximum of not less than 25°. The Professor remarks, that this discrepancy may arise

1. From difference of their elliptic orbit round the sun.
2. From their mutual action.
3. From the earth's attraction.

The first and second causes, on Prof. Erman's hypothesis of an elliptic ring, could not produce a discrepancy of more than 2° or 3°. In order that one of 10° should result from the third cause, it would be necessary that the relative velocity should be less than one third of that of the earth, in which case the orbits of the meteors would be inclined less than 14°, to the ecliptic. The author concludes, that a ring so near the earth, must be subject to very great perturbations, and if there is one, he thinks that no observations which we can make will enable us to calculate its motions with any degree of accuracy.

Dr. Ludlow and Dr. Mitchell presented a report from the committee, to whom had been referred Professor Tucker's paper, entitled "Psychological Observations on the Siamese twins, Cheng and Eng, made in 1836."

Soon after the arrival of the Siamese twins into the United States, now above eleven years ago, it appeared to me, says Prof. Tucker, that they afforded an opportunity of making some psychological observations which had never before been presented, unless perchance by some like freak of nature.

Here were two individuals who were precisely similar in all the circumstances likely to influence either their bodies or minds. They had always breathed the same air, eaten of the same food at the same time, slept and waked together, and taken the same exercises both in kind and quantity, and at the same moment. Whatever had affected the senses of the one, had affected those of the other. Their sources of knowledge, whether from observation or reasoning, and their lessons both of experience and education, were precisely the same. They had also been sick and well together, and may be supposed to have had in all respects, the same pleasures and pains, bodily and mental.

Placed in circumstances so similar, or rather identical, these twins suggested the inquiry whether there was a correspondent resemblance

in their faculties, passions and propensities; or if there was a diversity what was its nature and extent; and the result of the investigation seemed likely to shed no little light on the several theories, which have been put forth to explain the diversities of genius and mental character.

It is known that some maintain with Helvetius, that these diversities among men whose organs have the ordinary degree of soundness, are the result of the particular circumstances in which the different individuals chance to be placed, while others insist that the cause of such diversities is to be attributed mainly to a difference of organization. Of this opinion was Dr. Gall, who further maintained that the mental faculties and propensities of each individual were indicated by small protuberances at the surface of the brain, and that these might be discovered by means of correspondent protuberances on the skull. There is a third class comprehending a much larger number both of vulgar and philosophic minds, who think that our intellectual character depends partly on nature and partly on cultivation, and who would apply to mental excellence of every kind, what Horace says of poetical genius:

> —— ego nec studium sine divite venâ,
> Nec rude quid prosit video ingenium, alterius sic
> Altera poscit opem res et conjurat amice.

Now, if it should be found, on a careful comparison of the two brothers, that notwithstanding they had been placed in precisely similar circumstances, there was a marked difference in their faculties and tastes, they would seem to afford a satisfactory refutation of the doctrine of Helvetius. Should, however, no difference be discovered in their mental powers and propensities, then indeed, we should not be able to decide whether this close resemblance was to be attributed to the identity of circumstances in which they had been placed, or to that similarity of organization which is often seen in twins, and which nothing since their birth could, in this case, have disturbed.

To compare the minds of two persons whom we had so much reason to expect would think and feel alike, it occurred to me that the most eligible plan would be to propound the same questions at the same time to both, to take the answers of each, without the privity of the other, and that their answers thus obtained would enable us to decide whether there was any material difference in their tastes, faculties, and susceptibilities.

The first opportunity* which presented itself to me, of making the comparison, was in the city of New York, in the summer of 1836, I think, when I proposed the examination to them, through their conductor, Mr. Hale; and he having obligingly seconded my purpose, they also, after being satisfied about my motives, consented to submit to it.

The examination took place in the afternoon, in one of the rooms of the Clinton Hotel, and was thus conducted: a number of questions previously prepared, were propounded by Mr. Hale to Eng, and by me to Cheng. Their answers to each question, communicated to us in a whisper, were written down by us before we proceeded to another question. Some of the prepared questions, by the advice of Mr. Hale, were not asked, and one or two of their answers, in which they had indulged in personalities that might offend, were at their instance suppressed; with these exceptions, the questions and answers subjoined are to the letter as they were given.

Question 1. What part of America puts you most in mind of Siam?

Cheng. New Orleans.

Eng. Louisiana.

2. Where did you stay longest in England?

Both. In Glasgow.

3. Whom did you see first in London?

Cheng. I did not know him.

Eng. Charles something, but I can't recollect the whole name.

4. Have you been sick in this country? How long ill?

Cheng. Yes, twice, once fourteen days.

Eng. Yes, in New York, with a head-ache, and in Ohio with fever and ague.

By way of comparing their associating faculties, several words were then mentioned to them, and they were asked what these words suggested to their minds. Thus,

5. What does the word *London* suggest?

Cheng. What a dark place it is. They went about in the day by torch-light.†

Eng. St. Paul's.

* I had indeed seen them some time before, in the neighbouring village of Charlottesville, but they were too impatient to proceed on their journey to allow of the examination then.

† The Siamese youths reached London in November, when its fogs are most dense.

6. What, Liverpool, Boston?*

Cheng. Boston much the handsomest city.

Eng. Liverpool is much the dirtiest.

7. What, manufactures?

Cheng. The manufactures in Leeds.

Eng. They suggest the idea of the ingenuity of man.

8. What, war?

Cheng. The battle of New Orleans.

Eng. Very bad article to deal with: I think folks could get along better without it.

9. What, money?

Cheng. A mighty good thing.

Eng. Very good I think—quite opposite to war.

10. Whom of all our great men do you most admire?

Cheng. General Washington, John C. Calhoun.†

Eng. John C. Calhoun.

11. How large does the sun appear to you?

Cheng. As big as this room.

Eng. Not bigger than a decent sized centre table.

12. Are you willing to settle in America?

Cheng. I think not.

Eng. No.

13. What do you regard as the most useful invention?

Cheng. A ship.

Eng. Ship building.

14. What kind of animal food do you like best?

Cheng. Ducks, geese and roast beef.

Eng. Big goose.

15. What kind of vegetable food?

Cheng. No particular preference.

Eng. No choice—not being partial to any.

16. What kind of fruit?

Cheng. Peaches, pears, melons.

Eng. Musk melons.

17. What kind of perfume?

Both. Rose.

* These cities were intended to be the subjects of separate questions, but being by mistake conjoined in questioning one brother, they were put in the same way to the other.

† Their political predilections were then decidedly with the whigs, as the suppressed answers showed.

18. What colour do you like best?

Cheng. That depends upon what the thing is.

Eng. That depends upon whether for coach, person, handkerchief, or coat.

19. What colour do you like best in flowers?

There was a large vase in the room filled with flowers in great variety, and they both pointed to those that were of a saffron colour.*

20. What season of the year do you prefer?

Cheng. The spring.

Eng. The fall of the year.

21. What kind of music do you like best?

Both. The piano—the hunter's chorus.

22. What objects do you consider the handsomest, as possessing the greatest beauty?

Cheng. I could not answer that: I see so many.

Eng. Handsome women.

It will be perceived that none of the preceding questions were framed, with the view of comparing the powers of ratiocination of the twins. But, besides that the preparation of such questions would have required more time and care than I could then command, it was easy to see that our course of inquiry, however interesting to me, was becoming tiresome to them; nor am I sure that the very comparison I proposed to make did not give some shock to the feelings of pleasure with which they regard their *consentaneousness* on almost all subjects, whether of opinion or taste.

This general accordance in sentiment, which might have been inferred, was confirmed by Mr. Hale. It appeared from his answers to my inquiries, that they differed in opinion but seldom, and only on such occasions as those in which an individual may in a short time differ from himself, or experience a change of purpose; and the case he instanced was the time when they should leave a place—one thinking it better to quit on one day, and the other on another. But the difference never led to disputation. With these rare exceptions, there was an entire concurrence in their wishes, not merely from the similarity of their tastes and desires, but also from the unwillingness felt by each to contravene the desires or purposes of the other: as a

* As the dress of the Siamese priesthood must always be yellow, and the telapoins, or priests, constitute the most honourable class, it is probable that this preference for yellow may be ascribed to associations growing out of the customs of their country, especially as *red* seems to be the colour which is preferred by all civilized nations, whatever may be their natural complexion.

proof of this, he stated that they sometimes amused themselves with chess, but on these occasions they did not, as other persons, play one against the other, but both of them played on both sides. As no human beings have their sympathies so frequently appealed to, or in such constant exercise, they must be peculiarly strong in both. These brothers thus furnish the most perfect example of disinterested friendship that has ever existed, and they exhibit a phenomenon of moral beauty that is singularly pleasing.

Mr. Hale further stated, that Cheng was the most quick tempered of the two, to which they both assented. He is also a trifle the taller and the stronger, and *may* have the most energy of purpose. If so, the habitual exercise of his will in directing their actions, may insensibly give to him a greater desire of command, and to his brother a greater willingness to submit to it. But this exertion of authority would not be likely to pass beyond a certain point, as it would meet with a ready counteraction in the sympathetic feelings referred to. As each is to each almost another self, neither can take much pleasure in that which does not please the other, and while this extraordinary degree of fellow-feeling is not incompatible with the exertion of as much authority on the part of one brother, as the other may willingly submit to, it is inconsistent with a surrender of that other's decided wishes and desires.

But, on the other hand, the greater energy of will and of purpose, which has been supposed, may not exist, or if it does, it may be balanced by the greater powers of reflection possessed by Eng. Though the questions here propounded are too few to warrant any confident conclusions, we cannot but perceive that nearly half of his answers exhibit somewhat more of thought, or of precision than the answers of his brother. If this be a just inference, it affords persuasive evidence against the theory of Helvetius. How far these twins may support or refute the principles of phrenology, I did not inquire; not only because an examination of their heads, before their mental characters were accurately compared, would be premature, but also because it would be more satisfactory if made by those whose minds are more undecided about the merits of Gall's system than mine can pretend to be.

In conclusion, the author remarks, that his memoir was written not so much on account of the success of the experiment it details, as by way of suggesting its repetition to some other inquirer, under more favourable circumstances. Such a one would have the advantage of the greater strength which the peculiarities of these twins may be sup-

posed to have received from time and indulgence: he might propound to them a greater number of questions, prepared with more care; he might compare not merely a part of their mental faculties and propensities, but all of them; and lastly, he might ascertain whether the further development and growth of their passions have cast a shade over the interesting moral picture they once presented, of a singleness of purposes and desires in two individuals of the same sex.

The Committee, in their report, express the hope that the author of the paper or some other scientific individual may be induced to continue these interesting psychological inquiries.

Mr. Lea read a continuation of his paper on fresh water and land shells, which was referred to a committee.

Dr. Mitchell stated, that Dr. Hare and himself were engaged in the examination of the electrical effects of the escape of liquid carbonic acid. It is known, that on being liberated from pressure, this liquid is partially converted into gas, with the consequent production of so much coldness as to convert the remainder into a solid. On directing the jet from the receiver upon a metal disc, seated on the cap of a gold leaf electrometer, the leaves diverged, and on holding, by means of a glass handle, another metal plate to the jet, Dr. Hare perceived electrical sparks passing from the disc to his hand.

Dr. Mitchell concluded by observing, that the phenomena that might be presented on a further investigation would be reported at the next sitting of the Society.

Mr. Lea, as chairman of the Committee of Publication, laid before the Society a copy of Part 2, Vol. VII., of the Transactions.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. MARCH & APRIL, 1841. No. 17.

Stated Meeting, March 5.

Present, twenty-eight members.

Mr. DU PONCEAU, President, in the Chair.

A letter was received from Mr. William B. Wood, dated 1st March, 1841, accompanying a further donation of newspapers published in the English language, at Canton.

The following donations were announced:—

TO THE LIBRARY.

Flora Batava, ou Figures et Descriptions de Plantes Belgiques, &c. Liorn, 120. 4to.—*From H. M. the King of the Netherlands.*

Journal of the Asiatic Society of Bengal, N. S. Nos. 91 to 96, July to Dec., 1836, inclusive. 8vo.—*From the Society.*

The American Journal of Science and the Arts, conducted by Professor Silliman and Benjamin Silliman, Jr. Vol. XL. No. 1. Jan. 1841. 8vo.—*From the Editors.*

Journal of the Franklin Institute. 3d Series. Vol. I. Nos. 1 & 2. Jan. and Feb., 1841. 8vo.—*From the Institute.*

Lithographic Plates, illustrative of the Geology of New York.—*From Mr. Vanuxem.*

M'Elroy's Philadelphia Directory, and Williams's New York Annual Register, for 1840.—*From Mr. Du Ponceau.*

Catalogue of the Pennsylvania State Library, &c. 1839. 8vo.—*From the Hon. J. B. Anthony.*

The Canton Register, from Jan. 1830, to Aug. 1833. Fol.—*From Mr. William B. Wood.*

The Chinese Courier, from July, 1831 to Sept., 1833. 3 Vols. Fol. *From the same.*

The Chinese Repository, from May, 1832 to April, 1834. 2 Vols. 8vo.—*From Mr. Vaughan.*

Traité Élémentaire et Complet d'Ornithologie, &c., par F. M. Daudin. Paris, 1800. 2 Vols. 4to.—*From the same.*

Leçons de Géologie, données au Collége de France, par J. C. Delamétherie. Paris, 1816. 3 Vols. 8vo.—*From the same.*

FOR THE CABINET.

A donation was made to the Cabinet by Dr. Dunglison, of a specimen of the Chinese printing blocks, which had been presented to him by W. B. Driver, M.D., of Macao.

The Committe, consisting of Mr. Nicklin, Dr. Griffith, and Dr. Hays, to whom was referred a paper, read by Mr. Lea on the 21st Dec., 1838, entitled "On the Melania Cincinnatiensis," reported in favour of its publication in the Transactions; which was thereupon ordered.

The same Committee, to whom was referred the continuation by Mr. Lea, of his paper "On Fresh Water and Land Shells," read at the last meeting, reported in favour of its publication in the Transactions; which was thereupon ordered.

In this paper Mr. Lea describes fifty-seven new species; nearly the whole of them from this country:—

Unio Sapotalensis. Testâ ellipticâ, subinflatâ, inæquilaterali, posticè subbiangulatâ; valvulis crassis; natibus vix prominentibus; epidermide luteâ, dense radiatâ; dentibus cardinalibus subgrandibus; lateralibus magnis subrectisque; margaritâ subaureâ et valdè iridescente. *Hab.* Sapotal River, near Tlocatalpam, Mex.—*Dr. Burrough.*

Unio Tecomatensis. Testâ ellipticâ, inflatâ, inæquilaterali, posticè subbiangulatâ; valvulis crassis; natibus subprominentibus; epidermide subnigrâ, nitidâ; dentibus cardinalibus magnis; lateralibus magnis subcurvisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente. *Hab.* Tecomato River, near Tlocatalpam, Mex.—*Dr. Burrough.*

Unio Rajahensis. Testâ triangulari, inflatâ, inæquilaterali, posticè angulatâ; valvulis crassis; natibus valdè prominentibus; epidermide tenebroso-fuscâ; dentibus cardinalibus magnis; lateralibus sublongis curvisque; margaritâ albâ et valdè iridescente. *Hab.* The Rajah's tanks, Calcutta.—*Dr. Jay.*

Unio Bigbyensis. Testâ subtriangulari, compressâ, inæquilaterali, posticè angulatâ; valvulis subcrassis; natibus prominentibus; epidermide luteâ, valdè radiatâ; dentibus cardinalibus magnis, erectisque; lateralibus magnis subrectisque; margaritâ vel albâ vel salmonis colore tinctâ. *Hab.* Big Bigby Creek, Maury C. Tenn.—*T. R. Dutton.*

Unio crocatus. Testâ ellipticâ, inflatâ, inæquilaterali, posticè angulatâ; valvulis tenuibus; natibus prominentibus; epidermide croceâ, radiatâ, nitidâ; dentibus cardinalibus parvis; lateralibus longis curvisque; margaritâ salmonis colore tinctâ et iridescente. *Hab.* Savannah River, Geo.—*T. R. Dutton.*

Unio callosus. Testâ ellipticâ, compressâ, inæquilaterali, posticè angulatâ; valvulis crassis; natibus prominentibus; epidermide luteo-fuscâ, nitidâ; dentibus cardinalibus parvis; lateralibus longis curvisque; margaritâ albâ et iridescente. *Hab.* Ohio Canal, 12 miles below Columbus.—*Dr. Jay.*

Unio Duttonianus. Testâ valdè transversâ, cylindraceâ, valdè inæquilaterali, posticè angulatâ; valvulis subcrassis; natibus vix prominentibus; epidermide tenebroso-fuscâ, obsolete radiatâ; dentibus cardinalibus minimis; lateralibus longissimus rectisque; margaritâ albâ et iridescente. *Hab.* Ogechee Canal, Savannah, Geo.—*T. R. Dutton.*

Unio Georgianus. Testâ ellipticâ, subcompressâ, inæquilaterali, posticè subangulatâ; valvulis subtenuibus; natibus subprominentibus; epidermide luteo-fuscâ; dentibus cardinalibus parvis; lateralibus brevibus rectisque; margaritâ albâ. *Hab.* Stump Creek, Geo.—*T. R. Dutton.*

Anodonta Montezuma. Testâ obovatâ, subinflatâ, valdè inæquilaterali; valvulis tenuibus; natibus prominentibus; epidermide luteâ viridique, rugosâ; margaritâ albâ et iridescente. *Hab.* Central America—*Dr. Jay.*

Anodonta globosa. Testâ rotundâ, valdè inflatâ, inæquilaterali; valvulis tenuibus; natibus prominentibus, undulatis; epidermide viridi, obsolete radiatâ; margaritâ cæruleo-albâ et iridescente. *Hab.* Concha Lake, near Tlocatalpam, Mex.—*Dr. Burrough.*

Helix Tennesseensis. Testâ suprà plano-convexâ, subtus convexâ, luteâ, obliquo-striatâ, umbilicatâ; spirâ brevi; suturis subimpressis; anfractibus quinis subconvexis; aperturâ lunatâ; labro intus incrassato. *Hab.* Cumberland Mountains, Tenn.—*S. M. Edgar.*

Carocolla Edgariana. Testâ suprâ subplanâ, subtus convexâ, rufo-fuscâ, irregulariter striatâ, imperforatâ; spirâ brevi; suturis vix impressis; anfractibus quinis planulatis; aperturâ angustissimâ; columellâ dentem unicum longum et laminatum habente; labro incrassato, in medio incisso. *Hab.* Cumberland Mountains, Tenn.—*S. M. Edgar.*

Bulimus Jayanus. Testâ ovato conicâ, crassâ, suprà albidâ, subtus castaneâ, perforatâ; anfractibus senis, subconvexis; aperturâ ellipticâ; labro reflexo, albo margine lineato; columellâ albâ, lævi. *Hab.* Java?

Achatina turbinata. Testâ turbinatâ, albidâ obliquo-fasciatâ et maculatâ; striis minutis decussantibus, subcarinatâ; suturis impressis; anfractibus senis, convexis, infrà suturos impressis; aperturâ parvâ, ovatâ; columellâ incurvâ. *Hab.* Liberia.—*Dr. Blanding.*

Achatina striata. Testâ subcylindraceâ, corneâ, tenui, longitudinaliter elegantissimeque striatâ; suturis impressis; anfractibus octonis, subconvexis; aperturâ parvâ, ellipticâ; columella incurvatâ. *Hab.* Liberia.—*Dr. Blanding.*

Succinea gracilis. Testâ longo-ovatâ, obliquâ, exsertâ, subdiaphanâ, striatâ, pallido luteâ; spirâ elevatâ; suturis impressis; anfractibus subconvexis; aperturâ longo-ovatâ. *Hab.*—Java?

Succinea Wardiana. Testâ obliquo-ovatâ, subnitidâ, diaphanâ, obsolete stri-

atâ, luteâ; spirâ breviusculâ; suturis subimpressis; anfractibus ternis, convexis; aperturâ subrotundâ. *Hab.* Ohio.—*Dr. Ward.*

Succinea Totteniana. Testâ obliquo-ovatâ, subnitidâ, subdiaphanâ, obsolete striatâ, corneâ; spirâ brevi; suturis impressis; anfractibus ternis, convexis; aperturâ ellipticâ. *Hab.* Newport, R. I.—*Col. Totten, U. S. Army.*

Succinea Nuttalliana. Testâ longo-ovatâ, obliquâ, subnitidâ, diaphanâ, striatâ, pallido luteâ; spirâ subelevatâ; suturis impressis; anfractibus ternis, subconvexis; aperturâ longo-ovatâ. *Hab.* Oregon.—*Prof. Nuttall.*

Succinea aurea. Testâ obliquo-ovatâ, nitidâ, diaphanâ, lævi, aureâ; spirâ subelevatâ; suturis impressis; anfractibus ternis, convexis; aperturâ ovatâ. *Hab.* Springfield, Ohio.—*T. G. Lea.*

Succinea Candéana. Testâ obliquo-ovatâ, subnitidâ, obsolete varicosâ, diaphanâ, aureâ; spirâ brevi; suturis subimpressis; anfractibus ternis, inflatis, aperturâ lato-ovatâ. *Hab.* Martinique.—*Lieut. Candé.*

Succinea fulgens. Testâ obliquo-ovatâ, fulgens, diaphanâ, striatâ, aureâ; spirâ subelevatâ; suturis impressis; anfractibus ternis, convexis; aperturâ lato-ovatâ. *Hab.* Cuba.—*M. Poey.*

Succinea Oregonensis. Testâ obliquâ, tenui, rugoso-striatâ, rufâ, subdiaphanâ; spirâ exsertâ; suturis valdè impressis; anfractibus ternis, inflatis; aperturâ magnâ, lato-ovatâ. *Hab.* Oregon.—*Prof. Nuttall.*

Succinea inflata. Testâ subrotundâ, inflatâ, tenui, lacteâ; spirâ brevi; suturis subimpressis; anfractibus ternis, rotundatis; aperturâ lato-ovatâ. *Hab.* South Carolina.—*Prof. Ravenel.*

Planorbis regularis. Testâ subglobosâ, supernè subplanâ, subtus angusto-umbilicatâ, pellucidâ, pallido-luteâ, obsolete striatâ; anfractibus ternis, superne carinatis; labro acuto, marginato, intus incrassato; aperturâ ovatâ. *Hab.* U. States.

Planorbis Buchanensis. Testâ sublenticulari, supernè subconvexâ, ad periphæriam carinatâ, subtus angusto-umbilicatâ, vel corneâ vel subfuscâ, lævi; anfractibus ternis, ad peripheriam carinatis; labro acuto; aperturâ rotundâ. *Hab.* Near Cincinnati, Ohio.—*R. Buchanan.*

Planorbis bellus. Testâ orbiculari, supernè plano-concavâ, subtus late umbilicatâ, virido-luteâ, crebissimè et elegantissimè striatâ; anfractibus quaternis, supernè carinatis, subtus subcarinatis; labro acuto; aperturâ parvâ, subrotundâ, intus rufo-fuscâ. *Hab.* Tenn.—*Dr. Troost.*

Physa Hildrethiana. Testâ ellipticâ, subcompressâ, elongatâ, subpellucidâ; spirâ obtuso-elevatâ; anfractibus quinis; labro marginato; aperturâ longâ, compressâ. *Hab.* A Lake in Illinois.—*Dr. Hildreth.*

Physa inflata. Testâ inflatâ, tenebrosâ, subpellucidâ; spirâ subelevatâ, acuto-conicâ; anfractibus quinis; labro marginato inflatâ; aperturâ latâ. *Hab.* Virginia, between the Salt Sulphur and the Sweet Spring.—*P. H. Nicklin.*

Physa Troostensis. Testâ ellipticâ, subcrassâ, luteo-fuscâ, lævi; spirâ obtusâ; suturis subimpressis; anfractibus quinis, subconvexis; labro marginato, intus incrassato; aperturâ parvâ, ovatâ, contractâ. *Hab.* Near Nashville, Tenn.—*Dr. Troost.*

Lymnea Philadelphica. Testâ ovato-conicâ, tenui, striatâ, nitidâ, diaphanâ, subaureâ, imperforatâ; spirâ subelevatâ; suturis valdè impressis; anfractibus quinis, convexis; aperturâ angusto-ellipticâ. *Hab.* Schuylkill, near Philadelphia.

Lymnea Griffithiana. Testâ ovato-conicâ, tenui, substriatâ, nitidâ, subdiaphanâ, luteo-corneâ, perforatâ; spirâ breviusculâ; suturis impressis; anfractibus quinis, convexis; aperturâ ellipticâ. *Hab.* Charlotte Lake, Columbia Co. New York.—*Dr. Griffith.*

Lymnea Nuttalliana. Testâ ovato-conicâ, subtenui, striatâ, subdiaphanâ, pallido-fuscâ, imperforatâ; spirâ breviusculâ, apice rufâ; suturis impressis; anfractibus senis, convexis; aperturâ ovatâ, inflatâ, intus fasciatâ. *Hab.* Oregon.—*Prof. Nuttall.*

Lymnea Bulimoides. Testâ ovato-conicâ, subtenui, lævi, nitidâ, diaphanâ, fusco-luteâ, minutè perforatâ; spirâ breviusculâ; suturis parvis; anfractibus quinis subconvexis; aperturâ ovatâ. *Hab.* Oregon.—*Prof. Nuttall.*

Lymnea exigua. Testâ subfusiformi, tenui, striatâ, subdiaphanâ, pallido-luteâ, perforatâ; spirâ breviusculâ; suturis impressis; anfractibus quinis, subconvexis; aperturâ ellipticâ. *Hab.* Tenn.—*Dr. Troost.*

Lymnea planulata. Testâ ovato-conicâ, tenui, lævi, subdiaphanâ, fuscâ, perforatâ; spirâ breviusculâ; suturis impressis; anfractibus quinis, convexis; aperturâ parvâ, ovatâ. *Hab.* White Sulphur Springs, Va.—*P. H. Nicklin.*

Lymnea fusiformis. Testâ fusiformi, subcrassâ, crebrè-striatâ, pallido-luteâ, imperforatâ; spirâ breviusculâ; suturis leviter impressis; anfractibus senis, planulatis; aperturâ angusto-ellipticâ. *Hab.* Niagara River, Lewistown, N. Y. *Tobias Wagner.*

Lymnea rustica. Testâ subfusiformi, tenui, imperforatâ; spirâ sub-elevatâ; suturis impressis; anfractibus quinis, subconvexis; aperturâ angusto-ellipticâ. *Hab.* Poland, Ohio.—*Dr. Kirtland.*

Lymnea plica. Testâ turritâ, subtenui, luteâ, striatâ, imperforatâ; spirâ sub-elevatâ; suturis impressis; anfractibus quinis, convexis; aperturâ parvâ, ellipticâ. *Hab.* Tennessee.—*Dr. Troost.*

Lymnea coarctata. Testâ fusiformi, tenuissimâ, obsoletè striatâ, diaphanâ, corneâ, imperforatâ; spirâ brevi, mucronatâ; suturis leviter impressis; anfractibus quaternis, subplanulatis; aperturâ grandi, ovatâ. *Hab.* Newport, R. I.—*Col. Totten, U. S. Army.*

Lymnea casta. Testâ subfusiformi, subcrassâ, crebrè-striatâ, luteâ, perforatâ; spirâ subelevatâ, acuminatâ; suturis impressis; anfractibus senis, convexis; aperturâ grandi, ovatâ. *Hab.* Poland, Ohio.—*Dr. Kirtlund.*

Lymnea parva. Testâ subturritâ, tenui, lævi, diaphanâ, corneâ, subperforatâ; spirâ elevatâ; suturis impressis; anfractibus quinis, convexis; aperturâ ellipticâ. *Hab.* Cincinnati, Ohio.—*T. G. Lea.*

Lymnea curta. Testâ subturritâ, subtenui, nitidâ, subdiaphanâ, luteâ, perforatâ; spirâ elevatâ; suturis impressis; anfractibus senis, convexis; aperturâ parvâ, ellipticâ. *Hab.* Cincinnati, Ohio.—*T. G. Lea.*

Lymnea strigosa. Testâ longò-ovatâ, subobliquâ, diaphanâ, striatâ, corneâ, tenui, imperforatâ; spirâ brevi; suturis impressis; anfractibus quinis, subconvexis; aperturâ ovatâ. *Hab.* Near Cincinnati, Ohio.—*T. G. Lea.*

Lymnea Kirtlundiana. Testâ turritâ, tenui, irregulariter striatâ, pallido-corneâ, imperforatâ, elevatâ; spirâ attenuatâ; suturis impressis; anfractibus senis, subconvexis; aperturâ angusto-ellipticâ. *Hab.* Poland, Ohio.—*Dr. Kirtland.*

Lymnea rubella. Testâ ovato-conicâ, tenui, lævi, nitidâ, diaphanâ, rubellâ,

imperforatâ; spirâ breviusculâ; suturis parvis; anfractibus quinis, subconvexis; aperturâ subgrandi, ovatâ. *Hab.* Oahu.—*Prof. Nuttall.*

Paludina regularis. Testâ subglobosâ; subcrassâ, virido-corneâ, lævi, imperforatâ; spirâ brevissimâ; suturis impressis; anfractibus quinis, convexis; aperturâ magnâ, ovatâ, intus cæruleâ. *Hab.* Ohio?—*T. G. Lea.*

Paludina obtusa. Testâ subcylindraceâ, subtenui, tenebroso-viridi, lævi, minutè perforatâ; spirâ brevi, ad apicem valdè obtusâ; suturis impressis; anfractibus quaternis, convexis; aperturâ parvâ, subrotundâ. *Hab.* Ohio.—*Dr. Kirtland.*

Paludina Troostiana. Testâ ventricoso-conoideâ, tenui, pellucidâ, lutco-corneâ, lævi, perforatâ; spirâ brevi; suturis valdè impressis; anfractibus quaternis convexis; aperturâ magnâ, rotundatâ, albâ. *Hab.* Tenn.—*Dr. Troost.*

Anculosa Troostiana. Testâ ovato-conicâ, crassâ, minutè rugosâ, tenebroso-fuscâ; spirâ subelevatâ; suturis subimpressis; anfractibus planulatis; aperturâ rotundâ, intus cæruleâ; columellâ crassâ, vel albâ vel carneâ. *Hab.* Tenn.—*Prof. Troost.*

Anculosa gibbosa. Testâ subglobosâ, gibbosâ, crassâ, subnigrâ, crebrè striatâ; spirâ brevi; suturis impressis; anfractibus subplanulatis; aperturâ subquadrangulari, vel carneâ vel albidâ. *Hab.* Tenn.—*Prof. Troost.*

Anculosa dentata. Testâ subglobosâ, crassâ, subnigrâ; spirâ brevi, obtusâ; suturis impressis; anfractibus convexis; aperturâ magnâ, subrotundâ; columellâ crassâ, dentatâ. *Hab.* Vicinity of Richmond, Va.—*J. A. Warder, M.D.*

Anculosa carinata. Testâ ovato-conoideâ, carinatâ, tenebroso-olivaceâ; spirâ brevinsculâ; suturis parvis; anfractibus senis; aperturâ parvâ, rotundâ, intus albidâ, sulcatâ; columellâ subcrassâ, purpurcâ. *Hab.* Roanoke River, Lafayette —*J. A. Warder, M.D.*

Anculosa variabilis. Testâ obtuso-conoideâ, crassâ, vel fasciatâ vel corneâ vel carinatâ vel lævi; suturis linearibus; anfractibus senis, planulatis; aperturâ magnâ, subrotundâ; columellâ crassâ, vel albâ vel purpureâ. *Hab.* Roanoke River, Lafayette.—*J. A. Warder, M.D.*

Amnicola orbiculata. Testâ orbiculari, subtenui, luteolâ, lævi, umbilicatâ; spirâ brevi; suturis valdè impressis; anfractibus quinis, inflatis; aperturâ magnâ, rotundâ. *Hab.* Springfield, Ohio, and Schuylkill? near Philadelphia —*T. G. Lea.*

Amnicola parva. Testâ obtuso-conicâ, subtenui, luteolâ, lævi, umbilicatâ; spirâ brevi; suturis impressis; anfractibus quaternis, inflatis; aperturâ magnâ, subrotundâ. *Hab.* Springfield, Ohio.—*T. G. Lea.*

Io tenebrosa. Testâ fusiformi, subtenui, subnigrâ, lævi; spirâ conicâ; suturis vix impressis; anfractibus senis, subplanulatis; aperturâ irregulariter pyriformi, intus purpureâ. *Hab.* Tennessee.—*S. M. Edgar.*

Mr. Lea mentions, that regarding the sexual difference in the family Naïdes as no longer a matter of doubt, his attention had been given to the length of *gestation* and the periods of *parturition*. With this view tables were made of a series of observations, carried through nearly three consecutive years by Mr. T. G. Lea, at Cincinnati. These prove that many species in the same genus differ in their periods. In the course of

the examinations, it was remarked, that in the *U. multiplicatus*, Lea, and the *U. rubiginosus*, Lea, both lobes of the branchiæ were occasionally charged with ova on both sides.

Dr. Bache announced the decease of the Hon. Thomas L. Winthrop, of Mass., a member of the Society, which occurred at Boston on the 21st of February, 1841.

Dr. Patterson communicated a letter from Mr. Walker, dated 20th Feb., 1841, relating to the formulæ developed and used by him in his paper, entitled "Researches concerning the Periodical Meteors of August and November;" which was ordered to be deposited in the archives of the Society, with the paper to which it relates.

Professor Bache stated, that he had received a letter from Dr. Locke, of Cincinnati, relating to the Magnetic Observations made by the author, and published in the Society's Transactions and Proceedings; the matter of which he communicated to the Society, in accordance with the supposed wish of Dr. Locke.

The Secretaries, as a Committee to cause the Records and Documents of the Society to be arranged and bound, presented their Report, accompanied by a letter from J. Francis Fisher, Esq., who had been one of the Secretaries at the time when this duty was assigned to them, and upon whom the performance of it was devolved by them.

The Records and Documents presented with the report, are comprised in 19 large quarto, and 2 folio volumes, and are arranged in order of subjects, as follows:

I. Nominations of Members.
II. Letters of Acknowledgment from Members Elect.
III. Miscellaneous Correspondence.
IV. V. VI. Letters announcing Donations to the Library; and
VII. To the Cabinet.
VIII. Letters acknowledging Donations.
IX. Reports of Committees and Board of Officers.
X. Reports of Committees on Communications.
XI. MS. Communications on Mathematics and Astronomy.
XII. MS. Communications on Natural History, Fossil Remains, Mineralogy, and Geology.

XIII. MS. Communications on Natural Philosophy, Chemistry and Meteorology.

XIV. MS. Communications on Medicine, Anatomy and Physiology.

XV. MS. Communications on Mechanics, Machinery and Engineering.

XVI. MS. Communications on Trade, Commerce and Manufactures, Agriculture and Husbandry, and Economics.

XVII. MS. Communications on Philology, Literature, Antiquities, Geography and Education.

XVIII. The MS. draughts of the Judicial Opinions of Chief Justice Marshall, in the Circuit Court of the U. S., presented to the Society some years ago, by Mr. Brockenbrough of Richmond, Va. form this Volume.

Three other volumes contain: I. The Minutes of the Am. Phil. Society, previous to its union with the Am. Soc. for Promoting Useful Knowledge, from Jan. to Dec., 1768. II. and III. The Minutes of the Society under its present organization, from Jan., 1774, to June, 1787, inclusive, heretofore wanting; which Mr. Fisher has happily supplied by collating numerous memoranda, and occasional records found by him among the ancient papers of the Society.

In conformity to a provision of the Laws, the following stated appropriations were made for the current year:—

For the Hall, $200.

For the purchase of Journals, $200.

For binding, $100.

For current expenses, $550.

Stated Meeting, March 19.

Present, thirty-one members.

Mr. Du Ponceau, President, in the Chair.

Letters were read from the Secretary of the Royal Asiatic Society, dated Dec. 5, 1840, and from the Secretary of the Horticultural Society of London, dated Dec. 1, 1840, acknowledging the receipt of Part I. of Vol. VII., of the Transactions of this Society.

The following donations were announced:—

FOR THE LIBRARY.

A Continuation to the Alphabetical Index of the Matter contained in the Philosophical Transactions of the Royal Society of London, from Vol. LXXI. to Vol. CXX., 1781 to 1830. 2 Vols. 8vo.—*From the Society.*

Address of the Marquis of Northampton, President, &c. &c., read at the Anniversary Meeting of the Royal Society, on Saturday, Nov. 30, 1840. 8vo.—*From the same.*

Memoirs of the Royal Astronomical Society of London. Vol. XI. 1840. 4to.—*From the Society.*

Proceedings of the Royal Astronomical Society of London. No. 10. Dec. 1840. 8vo.—*From the same.*

On the Minute Structure and Movements of Voluntary Muscle, by William Bowman, Esq., Demonstrator of Anatomy in King's College, London, &c. 1840. 4to.—*From the Author.*

Experimental Researches on the Strength of Pillars of Cast Iron and other Materials, by Eaton Hodgkinson, Esq. London. 1840. 4to.—*From the Author.*

Niles's Weekly Register, Sept. 1836 to Sept. 1837. 2 Vols. 4to.—*From the Editor.*

Niles's National Register, Sept. 1837 to Sept. 1840. 6 Vols. 4to.—*From the Editor, Jeremiah Hughes, Esq.*

The History of Harvard University, by Josiah Quincy, LL.D., President of the University, Cambridge. 1840. 2 Vols. 8vo.—*From the Author.*

God, the Lord of All; a Missionary Tract in the Chinese Language. 8vo.—*From the Rev. B. H. and A. Bingham.*

O Auxiliador da Industria Nacional, &c. &c., anno 1840. Rio de Janeiro, 1840. 6 Nos. 8vo. Jan. to June.—*From Mr. J. S. Rebello.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie; uitgegeven door J. Van der Hoeven, M.D., &c., en W. H. de Vriese, M.D., &c. Amsterdam, 1840. 8vo.—*From the Editors.*

The Eclectic Journal of Medicine, edited by John Bell, M.D., &c. &c. Vol. IV. Nov. 1839 to Oct. 1840. Philadelphia. 8vo.—*From the Editor.*

The Select Medical Library, edited by John Bell, M.D., &c. &c. 5 Vols. Philadelphia, 1839, 1840. 8vo.—*From the same.*

Biographical Account of John Hadley, Vice-President of the Royal

Society, &c., and of his Brothers, George and Henry Hadley. London. 8vo.—*From Dr. Robert Hare.*

Annual Report of the Geologist of Maryland, 1840. 8vo.—*From the Author, Dr. J. T. Ducatel.*

The Theory of Money and Banks investigated; by George Tucker, Professor of Moral Philosophy in the University of Virginia, &c. &c. Boston, 1839. 12mo.—*From the Author.*

Epistle to Joseph John Gurney, on the Society of Friends; by Benjamin Hornor Coates, M.D. Philadelphia, 1841.—*From the Author.*

Rambles in Europe in 1839, with Sketches of Prominent Surgeons, &c. &c. &c.; by William Gibson, M.D., Professor of Surgery in the University of Pennsylvania, &c. Philadelphia, 1841. 12mo.—*From the Author.*

Professor Bache presented to the notice of the Society, the curves representing the Magnetic Observations made at Washington City, on the 6th of January last, and the five days succeeding, a drawing of which he had received from Lieut. Gilliss, the director of the Magnetic Observatory at that station.

Dr. Patterson presented to the Society a resolution recently adopted by the Controllers of the Public Schools, agreeing to deposite a transit instrument imported by them, for five years, from the 1st instant, in the Society's Observatory, on certain conditions. The resolution was referred to the Committee on the Observatory.

Dr. Mitchell referred to the experiments, in which he is still engaged with Dr. Hare, on the electricity produced during vaporization. He mentioned that the solid, formed when carbonic acid which has been liquefied by pressure escapes from the containing vessel, is found to have positive, and the receiver negative electricity. He proposes to communicate other results of these experiments at a future meeting of the Society.

Stated Meeting, April 2.

Present, twenty-three members.

Judge Hopkinson, Vice-President, in the Chair.

Letters were read—

From M. Guizot, dated Paris, Dec. 14, 1840; from Mr. John L. Stephens, dated New York, March 13, 1841; and from M. Pierre de Angelis, dated Buenos Ayres, Jan. 8, 1841, acknowledging the honour done them by their election as members of the Society:—

From the Secretary of the Geological Society of London, dated Jan. 7, 1841; from the Secretary of the Royal Asiatic Society, dated Jan. 2, 1841; from the Secretary of the Royal Geographical Society of London, dated Nov. 21, 1840; and from the Secretary of the Royal College of Surgeons, in London, dated Feb. 5, 1841, severally acknowledging the receipt of donations from this Society.

The following donations were received:—

FOR THE LIBRARY.

Astronomical Observations made at the Royal Observatory, Edinburgh, for the Year 1837. By Thomas Henderson, F.R.S., &c. Edinb. 1840. 4to.—*From the Royal Society of London.*

Annuaire Magnétique et Météorologique du Corps des Ingénieurs des Mines de Russie, &c. &c. Année, 1838. St. Petersburg, 1840. 4to.—*From the Imperial Academy of St. Petersburg.*

Journal of the Asiatic Society of Bengal. N. S. No. 18. 1840. 8vo.—*From the Society.*

Proceedings of the Royal Astronomical Society. Vol. V. Nos. 10 and 11. Dec. 1840, Jan. 1841. 8vo.—*From the Society.*

Journal of the Franklin Institute. Third Series. Vol. I. No. 3. March, 1841. 8vo.—*From the Institute.*

The American Quarterly Register, conducted by B. B. Edwards and W. Cogswell. Vol. XIII. No. 3. Feb. 1841. 8vo.—*From the Editors.*

Twenty-third Annual Report of the Controllers of the Public Schools

of the City and County of Philadelphia. 1841. 8vo.—*From Mr. G. M. Wharton.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D., &c. &c. Vol. IV. Nos. 21 & 22, Feb., 1841. 8vo.—*From the Editor.*

A Discourse on the Character, Properties, and Importance to Man, of the Natural Family of Plants, called Gramineæ or True Grasses. By Wm. Darlington, M.D. West Chester, 1841. 8vo.—*From the Author.*

Minutes of the General Assembly of the Presbyterian Church in the United States of America. For 1836, 1837, 1838, 1840. Philadelphia. 8vo.—*From Mr. Kane.*

A Dictionary, Hindoostanee and English. By Capt. Joseph Taylor, revised by W. Hunter, M.D. Calcutta, 1808. 2 Vols. 4to.—*From Mr. G. Henshaw Belcher.*

Coleccion de Obras y Documentos relativos a la Historia Antigua y Moderna de las Provincias del Rio de la Plata. Par Pedro de Angelis. Tomo Sexto. Buenos Aires, 1837. Fol.—*From the Author.*

The New Testament, with References to Parallel Passages, &c. &c. New York, 1832.—*From Mr. Vaughan.*

FOR THE CABINET.

A large Specimen of the Red Pipe Stone, from the country of the Sioux Indians.—*From Mr. J. N. Nicollet.*

Dr. Patterson read a paper, entitled "On the Expansion of the Function $x + h$, by Pike Powers, of the University of Virginia;" which was referred to a Committee.

Mr. Walker read a paper, entitled "Astronomical Observations made at Hudson Observatory, lat. 41° 14′ 40″ N., and long. 5° 25′ 45″ W., by Elias Loomis, Prof. Math. and Nat. Phil. in Western Reserve College;" which was referred to a Committee.

Dr. Patterson described the arrangement of a Thermometer, which he had caused to be attached to a steam boiler at the United States' Mint, for the purpose of indicating the pressure of the steam by reference to the temperature of the water.

The bulb of the thermometer was immersed in a bath of mercury, contained in a bent iron tube passing through the head of the boiler

below the water line; the stem of the thermometer being curved at its lower extremity to correspond with the tube. The scale was graduated as an indicator of pressure in accordance with the results of the experiments made by the Franklin Institute of Pennsylvania. A comparison of its indications with those of a very well made and carefully graduated safety valve, attached to the same boiler, had proved entirely satisfactory.

Dr. John Locke, of Cincinnati, a member of the National Institution, visiting the Society, was invited to make a communication explanatory of the "Safety Guard" of Mr. Cadwallader Evans, of Pittsburg, of which he presented a working model to the notice of the Society.

After some observations on the causes of accidents to high pressure boilers with flues, most of which were referred either to over pressure of saturated steam, or to over heating the flues when the water is low; and a brief historical sketch of the introduction of fusible alloys in aid of the safety valves and gauge cocks; Dr. Locke called the attention of the Society to the model of Mr. Evans's invention.

In this, the fusible alloy is placed in the bottom of an iron tube, which is inserted into the boiler and attached to it steam-tight by a flange at the top, or outer extremity, while the end containing the fusible metal is placed in contact with the upper part of the flue, so as to receive the greatest heat of the part first exposed by low water. A key, like the key of a common lock, pivoted in the alloy, continues fixed while the alloy remains solid, but is free to turn as soon as it fuses. The stem of the key, passing through a collar, terminates on the outside in a cylindrical head or pulley. To this a chain is fixed, which, after being wound round the cylindrical head, passes over a simple pulley at the end of the lever of the safety valve, and there suspends the weight.

While the alloy remains solid, the action of this weight is the same as if it were attached to the lever itself, as in the common arrangement of the safety valve. When the temperature of the "guard" reaches the point for which the alloy was composed; in consequence either of the excessive temperature of the steam that surrounds it, or of the water sinking below the top of the flue on which it rests; the alloy melts: the weight acting on the chain turns the loosened key, the chain is unwound, and the weight, descending upon a platform placed to receive it, relieves the safety valve of its load.

The "safety guard" has the recommendation of great simplicity,

and of placing it out of the power of the engineer to transcend the assigned limit of pressure on the boiler. When it goes into action, it stops the engine for the time, but permits the motion to be renewed as soon as the cause of danger is removed either by the escape of steam or the cooling of the flue. The alloy having again become solid, the chain is passed round the cylinder anew, and the engine proceeds as before.

Dr. Locke illustrated these remarks by successful experiments with the working model. He added, that the apparatus, with different modifications which he described, has been applied to more than twenty boats on the Ohio and Mississippi rivers, during a length of time sufficient to test its practical usefulness, and that it is rapidly gaining popularity with the proprietors of steam-boats, and with the public.

Professor Bache, at the instance of Dr. Locke, gave a brief history of the different applications of fusible metal to steam-boilers.

He stated that the experiments of the Franklin Institute had proved the necessity of preventing the steam from pressing directly on the fusible metal, in consequence of the liability of the metal to separate into portions of different fusibility when submitted to such pressure. He mentioned that Mr. Evans had adopted the same mode of applying fusible metal as the Committee of the Institute, and at about the same time. Professor Bache then described the less perfect apparatus first devised by Mr. Evans, and alluded to one of his own which he had himself published subsequently. He referred to the peculiarities of the arrangement exhibited by Dr. Locke, and expressed his satisfaction at the prospect of the safety guard being introduced into general use, under the auspices of a practical mechanic like Mr. Evans.

Mr. Walker mentioned some strictures which he had received from a correspondent, upon a paper, by Miss Morris "On the Hessian Fly," now in the press of the Society, and of which an abstract was published in its Proceedings for December last.

Dr. Coates argued, that the history of the larva of the Hessian Fly could by no means be considered settled; and that the subject was properly open for present and future examination.

This he endeavoured to support by pointing out inconsistencies in the descriptions of the best writers; remarking, that Mr. James Worth,

and Baron Von Menninger had seen larvæ similar to that described by Miss Morris; the latter of which were thought by Curator Köllar to produce the Cecidomyia Destructor of Say, although in Germany, in which that species was not hitherto known to exist; and some of the former of which were found by Mr. Worth, to produce pupæ under the sheath of the leaf, as the Cecidomyia does. Other illustrations were drawn by Dr. Coates, from nearly related species; and it was urged that the law by which insects possess a power of accommodation to circumstances, in depositing their eggs in unusual and diversified places, to the great modification of the larva, had never been shown to be inapplicable to this case.

Part of the objections of Mr. Walker's correspondent, were referred by Dr. Coates to an error in the minutes, and which had been transferred to the published Proceedings of the Society; by which Miss Morris was incorrectly represented as mentioning in her paper the parasitic insect which stings the Hessian Fly. In the opinion of Mr. Westwood, as stated by Dr. C., this parasite, generally known as a Ceraphron, should be referred to the genus Pteromalas.

Mr. Lea, on behalf of the Committee of Publication, laid upon the table Part 3, Vol. VII. of the Transactions of the Society, which completes the volume.

In accordance with a recommendation contained in a Report from the Secretaries, they were discharged from the further consideration of the subject referred to them by the Society's resolution of 15th January last.

Stated Meeting, April 16.

Present, forty-seven members.

Mr. Du Ponceau, President, in the Chair.

Major Graham, of the United States' Army, and Professor Alexander, of Princeton, N. J., members elect, were introduced, signed the Laws, and took their seats.

Letters were read—

From Mr. Francisco Martinez de la Rosa, dated Paris, 15th Feb. 1841, making acknowledgments for the honour of his election to membership:—

From the Secretary of the Royal Society of Sciences, Agriculture and Arts, of Lille, dated 2d Feb. 1841, proposing a correspondence and interchange of publications with this Society; which was, on motion, referred to a committee:—

From the President of Harvard University, dated 9th April, 1841, acknowledging the receipt of the Transactions, N. S. Vol. VII. Part 2.

The following donations were announced:—

FOR THE LIBRARY.

Journal of the Asiatic Society of Bengal. Nos. 100, 101. Calcutta, 1840. 8vo.—*From the Society.*

Transactions of the Agricultural and Horticultural Society of India. Vol. VII. Calcutta, 1840. 4to.—*From the Society.*

Constitution and Laws of the New York Historical Society. New York, 1839. 8vo.—*From the Society.*

Proceedings of the National Institution for the Promotion of Science. Washington, 1841. 8vo.—*From the Institution.*

History of Harvard University from its Foundation in 1638, to the Period of the American Revolution. By Benjamin Peirce, &c. &c. Cambridge, 1833. 8vo.—*From the President and Fellows.*

Fifty-fourth Annual Report of the Regents of the University of New York. Albany, 1841. 8vo.—*From the Regents.*

Catalogue, &c., of Bowdoin College and the Medical School of Maine. Brunswick, 1841. 8vo.—*From Professor D. A. Goodwin.*

The American Medical Library and Intelligencer. Edited by Robley Dunglison, M.D., &c. &c. Vol. IV. No. 23.—*From the Editor.*

Historical Letters on the First Charter of Massachusetts. By Abel Cushing, &c. &c. Boston, 1839. 16mo.—*From the Author.*

The American Journal of Medical Sciences, conducted by Isaac Hays, M.D. &c. &c. April, 1841.—*From the Editor.*

The American Journal of Science and Arts, conducted by Benjamin Silliman and B. Silliman, Jr. N. S. No. 2. April, 1841.—*From the Editors.*

A Sermon preached by Rev. Jared L. Elliott, before the Officers of the U. S. Exploring Expedition, on the Occasion of the Death of Lieut. J. A. Underwood and Midshipman Wilkes Henry. Honolulu, Oahu, 1840.—*From Mr. Titian R. Peale.*

The Northern Light. Vol. I. No. 1. Albany, N. Y. 1841.—*From Dr. T. Romeyn Beck.*

Dr. Bache announced the death of Dr. Samuel Colhoun, a member of the Society, who died on the 7th of April, 1841, aged fifty-four.

Mr. Walker read a paper, entitled "A Continuation of Astronomical Observations made at Hudson Observatory, by Elias Loomis, Professor of Mathematics and Natural Philosophy at Western Reserve College;" which was referred to a committee.

Mr. Walker read a letter from Mr. Simeon Borden, dated Boston, 6th April, 1841, giving the results of the Trigonometrical Survey of the State of Massachusetts, lately completed by him, and those obtained by Mr. Paine's Chronometrical Survey of the same State; which was referred to a committee.

Professor S. Alexander, of Princeton, made an oral communication on the subject of the Meteor of March 15th.

He prefaced his communication by a notice of the arguments, as stated by M. Arago, which tend to show that aerolites cannot be of terrestrial origin; a conclusion which Prof. A. regarded as irresistible: and, in view of it remarked, that he regarded the aerolites themselves as presenting a subject of special interest, inasmuch as whatever might be their origin, they telegraphed to us the fact, that matter such as that with which we were familiar, existed apart from the earth; it having been demonstrated by an analysis of the fragments which have, from time to time, dropped from the bodies in question, that they were composed of materials similar to those which exist upon our planet.

Prof. Alexander described the meteor which he had observed at Princeton.

It was, as he stated, of a white or bluish white colour, except that one half,—the following half of it, as regarded the direction of its apparent motion,—was bordered with red. He observed, moreover, that the atmosphere was so hazy at the time, that even Venus was seen but indistinctly. From a comparison of the relative positions of this planet and the meteor, at the time of the sudden disappearance of the latter, he concluded that its azimuth at that time was 86°, and its altitude 29°. He estimated its apparent diameter to have been somewhat less than half that of the Moon, or about 12′ or 13′. He had seen a newspaper account of observations made of the same me-

teor at New Haven, in which it was stated, that the observed azimuth, at the time of its disappearance, was 68°, and its altitude 11°.

From these elements, it resulted, that the meteor, when it disappeared, must have been 223.35 English miles distant from New Haven; and 131.73 from Princeton. The perpendicular altitude deduced from the New Haven observation, was 48.71 miles; from that at Princeton, 65.79 miles. The diameter of the meteor, from the observation at the latter place, was 0.4598 of a mile.

Prof. Alexander remarked, in conclusion, that these results, in so far as they admitted of a comparison, did not accord very well; and that accounts of other observations were desirable.

Professor Henry mentioned, that he had recently repeated some experiments of Becquerel and Biot on phosphorescence, the results of which demonstrate the existence of an emanation from incandescent bodies, particularly when in an electrical state, of a character not heretofore known. He promised to give a more full account of these at a future meeting of the Society.

The following gentlemen were elected members of the Society.

Major Edward Sabine, V. P. R. S.

Isaac R. Jackson, of Philadelphia.

Professor Roswell Parke, of the University of Pennsylvania.

Dr. Robert Christison, F. R. S. of Edinburgh.

Professor Edward Hitchcock, of Amherst College, Mass.

William Peter, H. B. M. Consul, at Philadelphia.

A. P. de Candolle, of Geneva.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. MAY & JUNE, 1841. No. 18.

Stated Meeting, May 7.

Present, twenty-seven members.

Mr. DU PONCEAU, President, in the Chair.

Mr. Isaac R. Jackson, and Professor Roswell Park, members elect, were introduced, and signed the Laws.

Letters were received, and read :—

From the Perpetual Secretary of the Royal Academy of Inscriptions, &c., Institute of France, dated 16th Nov. 1840, and 15th Feb. 1841, acknowledging the receipt of Vol. VII. Part 1, of the Transactions, and of No. 13, of the Proceedings of the Society.

From M. Felix Lajard, Provisional Secretary of the Royal Academy of Sciences, Institute of France, dated 8th Dec. 1840, accompanying Vol. XIV. Part 2, of its Memoirs, and communicating information relative to the course of the Academy's publications, its public sittings, the prizes it distributes, &c. The Provisional Secretary announces the purpose of the Academy to transmit its weekly reports, *procés verbaux*, &c., with renewed regularity to the Society, and invites a closer correspondence, and more frequent interchanges between the two Institutions.*

From Count J. Grâberg de Hemsö, to the Librarian, dated Florence, 26th Nov. 1840, and 4th Jan. 1841, and to one of the

* The programme of prizes, &c., referred to in M. Lajard's letter as accompanying it, and to which the Society was requested to give publicity, did not arrive.

Secretaries, dated 16th Jan. 1841, relating to numerous donations heretofore transmitted by him to the Library.

The following donations were announced :—

TO THE LIBRARY.

Des Moyens de soustraire l'Exploitation des Mines de Houille aux chances d'Explosion, &c. &c. Brussels, 1840. 8vo.—*From the Royal Academy of Brussels.*

Transactions of the Royal Irish Academy. Vol. XIX. Part I. Dublin, 1841. 4to.—*From the Academy.*

Transactions of the Royal Society of Edinburgh. Vol. XIV. Part I. Edinburgh 1839. 4to.—*From the Society.*

Proceedings of the Royal Society of Edinburgh. Nos. 13, 14, 15, 1838, 1839. 8vo.—*From the same.*

Astronomical, and Magnetical, and Meteorological Observations, made at the Royal Observatory, Greenwich, in the year 1839, &c. &c. London, 1840. 4to.—*From the Royal Society.*

List of the Council, Scientific Committees, and Fellows of the Royal Society, Nov. 30, 1840. 4to.—*From the same.*

Proceedings of the Royal Society. No. 45. Nov. 1840. 8vo.—*From the same.*

The Laws of the Historical Society of Science, and List of its Officers and Members. London, 1840. 8vo.—*From the same.*

Institut Royal de France: Séance Publique Annuelle de l'Académie des Inscriptions et Belles Lettres, du Sept. 25, 1840. Paris, 1840. 4to.—*From the Institute.*

Mémoires de l'Institut Royal de France, Académie des Inscriptions et Belles Lettres. Tome XIV. Paris, 1840. 4to.—*From the same.*

Société d'Encouragement pour l'Industrie Nationale, Calendrier pour 1841, Liste des Membres, &c. Paris.—*From the Society.*

Recueil des Actes de la Séance Publique de l'Académie Impériale des Sciences de St. Pétersbourg, tenue le 29 Déc. 1838. St. Petersburg, 1839. 4to.—*From the Academy.*

Recueil des Actes de la Séance Publique de l'Académie Impériale, &c. &c., du 29 Déc. 1839. St. Petersburg, 1840. 4to.—*From the same.*

Mémoires de l'Académie Imperiale, &c. &c. VIme. Sér.—Sciences Politiq. Hist. Philolog. Tom. IVme, 4me et 5me Livrns.—Sciences Mathém. Phys. et Natur. Tome IVme, prém. Partie.

Mathém. et Phys. Tom. IId, 3me et 4me Livrns.—Sciences Mathém. Phys. et Natur. Tom. Vme. 2d Partie. Natur. Tom. IIIme, 1re, 2de, 3me et 4me Livrns. St. Petersburg, 1839, 1840. 8 Livrns. 4to.—*From the same.*

Vocabulario Universale della Lingua Italiana. Vol. VI. Fasc. XXXVII. Vol. VII. Fasc. XL. XLI. Naples, 1839, 1840. Fol. *From the Chev. Morelli.*

De la Vérité; ou Méditations sur les moyens de parvenir á la Vérité, &c. &c., par J. P. Brissot de Warville, (with MS. Notes by the Author.) Neufchatel, 1782. 8vo.—*From Mr. John Penington.*

Nouveaux Documens relatifs á l'emploi alimentaire de la Gelatine en 1840, par M. d'Arcet, &c. &c. Paris, 1840. 8vo.—*From Mr. D. B. Warden.*

Specchio Geografico, e Statistico, del l'Impero di Marocco, del Cavaliere Conte Jacopo Grâberg di Hemsö, &c. &c. Genoa, 1834. 8vo.—*From the Author.*

Nouvelles Recherches sur l'Inscription en lettres sacrées du Monument de Rosette. Florence, 1830. 8vo.—*From the same.*

Cenni Geografici e Statistici su l'Asia Centrale, e principalmente sul paese dei Kirghizi e sul Khanato di Khiva, per Jacobo Grâberg da Hemsö, &c. &c. Milan, 1840. 8vo.—*From the same.*

Descrizione delle orde e delle steppe dei Kirghizi-Kazaki, opera dal Signor Alessio de Leuchine, oro notomizzata per Jacopo Grâberg da Hemsö. Milan, 1840. 8vo.—*From the same.*

Dalla Necessita d'un Istituto Agrario che stabilmente provveda all'incremento dell'Agricoltura Toscana, &c. &c. Memoria dal Marchese Francesco Maria Riccardo del Vernaccia, &c. &c. Florence, 1839. 8vo.—*From the same.*

The same Memoir, translated into French, by Count J. Grâberg da Hemsö. Paris, 1840. 8vo.—*From the same.*

Sul Sistema di Rotazione in Coltura, &. &c. Memoria dal Conte Jacopo Grâberg da Hemsö. Florence, 1840. 8vo.—*From the same.*

Thirteen Reviews, &c. for different periodical publications, by Count J. Grâberg da Hemsö. 1829—1839.—*From the same.*

Phrenology; a Lecture delivered before the Woodville Lyceum Association, by Mariano Cubi i Soler, Professor of Modern Languages, &c. &c. Boston, 1840. 8vo.—*From the Author.*

Report of a Survey and Exploration of the Coal and Ore Lands belonging to the Alleghany Coal Co. &c. &c. By Walter R. John-

son, A.M. &c. &c. Philadelphia, 1841. 8vo.—*From the Author.*

Review of the Dictionarium Anamitico-Latinum, &c. By John Pickering, Esq. &c. &c. Boston, 1841. 8vo.—*From the Author.*

Eighth Annual Report of the Managers of the Pennsylvania Institution for the Instruction of the Blind. Philadelphia, 1841. 8vo.—*From the Managers.*

A Memoir, &c. of the late Joseph Parrish, M.D. &c. &c. By George B. Wood, M.D. Philadelphia, 1840. 8vo.—*From the Author.*

A Discourse on the Death of William Henry Harrison, &c. &c. By George W. Bethune, Minister of the Reformed Dutch Church, Philadelphia, 1841. 8vo.—*From the Author.*

Biographical Notice of Benjamin Silliman, M.D. LL.D. &c. &c. By Professor Kingsley.—*From Mr. Vaughan.*

Statistics of the Class of 1837, Yale College. 1840. 8vo.—*From Mr. B. Silliman, Jr.*

Contributions towards a History of the Star-Showers of former Times. By Edward C. Herrick, &c. &c. 1841. 8vo.—*From the same.*

Catalogue of Books, &c. added to the Library of the N. Y. Historical Society since Jan. 1839. New York, 1840. 8vo.—*From the Society.*

Twenty-fourth Report to the London Provident Institution, or Bank for Savings. 20th Nov. 1840.—*From William Vaughan, Esq.*

A Plan, showing the Progress of the Thames Tunnel.—*From Petty Vaughan, Esq.*

Abstract of a Meteorological Journal for the year ending 30th Nov. 1840, kept by N. W. Hatch, in the city of Vicksburg, Lat. 32½°. *From the Author.*

Register of Debates in Congress, by Gales & Seaton. Vols. I. II. 1824, 1825, 1826. 8vo.—*From Mr. John Vaughan.*

Lieut. John A. Dahlgren, U. S. N. deposited in the Library of the Society—

The Statistical Reports on the Health of the British Navy, for the Years 1830 to 1836, inclusive; and The British Navy Estimates for the Year 1840–41.

The Committee, consisting of Mr. Walker, Dr. Patterson, and Mr. Justice, to whom was referred a paper, read on the 2d and 16th of April last, entitled "Astronomical Observations at

Hudson Observatory, by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College," reported in favour of its publication in the Transactions; which was ordered accordingly.

The paper of Professor Loomis contains the Astronomical Observations made at the Hudson Observatory in 1840, and part of 1839, being a sequel to those published in Vol. VII. Part I. Art. IV. of the Transactions.

1st. The latitude of the observatory is determined to be 41° 14′ 40″,—being the mean from 9 lower culminations of Polaris, in 1840, giving 41° 14′ 42″.3, and 6 upper culminations in 1839, giving 41° 14′ 38″.1. Its longitude is stated to be 5h 25m 45s West.

2d. The series of moon culminations, ending last year with No. 50, is now extended to No. 125; and the method is pointed out, by which observations of the moon's limb, which have been made on a side wire, are reduced to the middle wire of the instrument.

3d. Seven occultations of fixed stars by the moon, are given.

4th. Observations are presented of the 2d Comet of 1840, discovered by Galle, January 25, at Berlin. The proximate elements of this Comet by Encke, were received by Professor Loomis, from Mr. S. C. Walker, on the 14th of March; and the Professor having prepared an ephemeris, found the Comet on the next clear evening, the 18th, and made satisfactory observations of its place in the heavens.

These observations, corrected for parallax and refraction, are stated as follows:

1840.	Berlin Mean Time.			Comet's A. R.			Comet's Dec.		
	h	*m*	*s*	*h*	*m*	*s*	°	′	″
March 18	14	18	12.34	29	40	43.8			
	14	28	54 89				+ 22	49	51.8
19	14	8	4.04	30	7	45.1			
	14	9	27.52				+ 22	17	5.9
21	14	32	5.63	31	1	2.5			
	14	0	23 72				+ 21	14	49.0
25	14	12	52.44	32	40	7.8			
	14	34	24.72				+ 19	15	35.1
April 1	14	22	41.82				+ 16	7	29.7
2	14	23	15.53	35	39	25.0			
	13	57	59.69				+ 15	42	2.0

These, with 34 observations by Rümker, at Hamburg, 26 by Argelander, at Bonn, and 12 by Encke, at Berlin, received through

Mr. Walker, Mr. Loomis compares with the ephemeris of Mr. R. Kysæus, and thence deduces, for six intermediate dates, the normal places of the Comet, for 8 o'clock P. M., mean time Berlin.

Date 1840.	Comet's places freed from aberration. A. R.	Comet's places freed from aberration. Dec.	Corrections of Ephemeris. A. R.	Corrections of Ephemeris. Dec.	Probable error of normal places.
d h	° ′ ″	° ′ ″	″	″	″
Jan. 31 8	326 25 5.3	+ 61 25 15.4	+ 14.7	— 8.1	+ 2.7
Feb. 12 8	358 8 24.9	51 2 50.7	— 12.7	— 1.1	2.5
23 8	13 19 36.0	40 11 32.5	— 17.3	+ 7.8	1.7
March 3 8	21 1 17.4	32 39 19.0	— 28.0	+ 17.6	1.2
12 8	26 34 40.9	26 28 14.8	— 32.6	+ 22.4	1.5
24 8	32 9 57.6	19 52 15.7	— 40.2	+ 25.0	1.9

Prof. Loomis then gives the perturbations of the Comet, computed after the method of Bessel for the Comet of 1807, for 3 intervals of 18 days each, from which their values are interpolated for the 6 dates, and subtracted from the Comet's normal places, previously referred to the ecliptic, and the mean equinox, Jan. 1st, 1840: thus

Date.	Perturbations. Long.	Perturbations. Lat.	Comet's Longitude less Perturbations.	Comet's Latitude less Perturbations.
	″	″	° ′ ″	° ′ ″
Jan. 31	0.0	0.0	15 0 50.0	+ 65 37 49.6
Feb. 12	0.0	— 1.1	24 50 22.3	46 10 41.5
23	— 0.2	— 1.9	29 22 27.8	31 27 35.5
March 3	— 0.4	— 2.3	32 2 14.6	22 0 28.2
12	— 0.7	— 2.5	34 14 5.2	14 26 39.0
24	— 1.1	— 2.7	36 45 4.7	6 27 27.7

From these, by means of 12 equations of condition resolved by the method of least squares, Prof. Loomis derives the parabolic elements of the Comet, and then by varying the sixth element, (the eccentricity,) after Bessel's example, obtains the elliptic elements, both as follows, the motion being retrograde.

Perihel. passage, m. t. Berlin,	Parabolic Elements. March 12*d*. 981921	Elliptic Elements. March 13*d*. 153768
Longitude of Perihel.	80° 20′ 24.4	80° 12′ 3.52
,, ascending node,	236 48 39.3	236 50 34.67
Inclination of orbit,	59 14 2.4	59 12 36.14
Logarithm. of Perihel. dis.	0.0870185	0.0865202
Eccentricity,		0.99323412
Semi-axis major,		180.383
Periodic time,		2422.6 yrs.

The errors of the respective orbits, are as follows: those in longitude being multiplied by the cosine of declinations.

Date.	Errors of Parabolic Elements.		Errors of Elliptic Elements.	
	Longitude.	Latitude.	Longitude.	Latitude.
Jan. 31	+ 4".4	+ 2".6	+ 0".6	+ 1".8
Feb. 12	— 1.4	— 1.9	+ 0.4	— 3.9
23	— 6.1	+ 1.5	— 2.6	+ 2.0
March 3	— 2.7	— 1.7	+ 0.1	+ 0.6
12	+ 0.1	— 0.7	+ 0.5	+ 1.1
24	+ 5.9	+ 1.1	+ 0.9	— 1.5
	Sum of Squares of Errors, 117".85		Sum of Squares of Errors, 34".62	

Mr. Loomis remarks, in conclusion, that there is no room for hesitation in the choice between the two orbits, though the last element is liable to considerable uncertainty.

Mr. Boyé communicated to the Society the results of the analysis of three different varieties of felspar from the primary rocks of the State of Delaware, as performed by Professor Booth and himself.

In the granitic veins that traverse the Serpentine, at Tucker's quarry, six miles N. W. of Wilmington, the felspar occurs in large masses, of which two different varieties may be distinguished; one having most of the characters of common potassa, felspar, or orthoclas, which is used for several technical purposes; the other resembling albite or soda-felspar, and exhibiting a peculiar tendency to undergo decomposition. As these two varieties of felspar may be supposed to enter generally into the composition of the gneiss and other primary rocks of this region, and thereby affect, not merely their mineralogical character, but also their stability when employed in construction, or for other purposes, it was considered a matter of interest to know their exact composition. They were, therefore, subjected by Prof. Booth and Mr. Boyé, to a thorough analysis by fusion with three times their weight of carbonate of soda, &c. &c. To determine their alkalies, they were decomposed by exposure on a shallow platinum capsule, to the vapours of fluohydric acid, in a close leaden vessel as described by Brunner. The fluosilicates were then decomposed by concentrated sulphuric acid, and the alumina precipi-

tated by ammonia; and after the remaining sulphates had been converted into carbonates by acetate of lead, and the carbonates of soda and potassa into chlorides, the joint weight of these two chlorides was ascertained, and the chloride of potassium afterwards separated by chloroplatinate of sodium and alcohol. The results thus obtained were as follows:

Felspar, from the granitic vein at Tucker's quarry, six miles N. W. of Wilmington.

1st variety. (Orthoclas.)

Colour white; lustre vitreous, inclining to pearly; translucent. Fracture distinctly rhomboidal, traversed by innumerous parallel cracks or fissures, which impart to it a milky or opaque appearance. Specific gravity in piece, 2.562, in powder, 2.585, at temperature 69° F.

Composition in 100 parts.

		Oxygen.		
Silica	65.24	33.89		
Alumina	19.02	8.88		11.83
Peroxide of Iron	a trace			
Magnesia	0.13	0.050	2.948	
Lime	0.33	0.092		
Soda	3.06	0.782		
Potassa	11.94	2.024		
	99.72			

2d variety. (Albite.)

Colour white, transparent; lustre pearly, inclined to vitreous. Fracture more irregular; the surface of the fracture striated, curved, or exhibiting obtuse angles. Hardness slightly inferior to the former. It fuses with great difficulty before the blow-pipe, but is slightly more fusible than the preceding. Specific gravity in piece 2.612, at 71° F.

Composition in 100 parts.

		Oxygen.		
Silica	65.46	34.01		
Alumina	20.74	9.685	9.85	13.22
Peroxide of Iron	0.54	0.165		
Magnesia	0.74	0.286	3.37	
Lime	0.71	0.227		
Soda	8.98	2.552		
Potassa	1.80	0.305		
	99.97			

Mr. Boyé remarked, that felspar being a double oxysalt of two

neutral silicates, one of a base containing 2 atoms of metallic radical with three atoms of oxygen (alumina and peroxide of iron), the other a silicate of such alkaline or earthy bases, as contain one atom of radical combined with one atom of oxygen (potassa, soda, lime, magnesia (?)), the oxygen contained in the silica ought always to be three times that contained in all the bases; while again the oxygen in the alumina and peroxide of iron ought to be equal to three times that contained in the other bases. He called attention to the fact, that this latter is exactly the case in both of the above varieties, but that if the oxygen contained in all the bases be multiplied by three, a small deficiency of oxygen is made apparent in the silica of the first variety, amounting to 1.6; ($3\times11.83=35.49$;) but, that the deficiency of oxygen in the second variety is so great, amounting to 5.6, ($3\times13.22=39.66$), that it cannot be accidental. Indeed, the proportion of oxygen in the silica to that in the bases of this variety, may be nearly indicated as $2\frac{1}{2}$ to 1, ($2\frac{1}{2}\times13.22=33.05$); thus leaving it uncertain, in Mr. Boyé's opinion, whether it be a different variety, or a mixture of a felspar with an analogous subsilicate. The specimen employed for analysis showed no signs of commencing decomposition, though it would seem natural to connect the deficiency of silica which it exhibited with liability to such a change. The analyses also exhibit the fact, that the principal alkali in the first variety is potassa, with a comparatively small proportion of soda, while the alkali in the latter is principally soda, with a small amount of potassa.

Mr. Boyé proceeded to remark, that the rock which constitutes the south-eastern portion of the primary formation of the state, differs in many respects from the others, and has received the appellation of *the blue rock* from its peculiar colour. The principal constituent of this rock is a translucent felspar, of a bluish or smoky colour, which sometimes in an irregular congregation constitutes the whole mass. The rock affords, in many places, a very superior material for architectural purposes, and its principal constituent, the felspar, was therefore likewise subjected to analysis, with a view to compare it with the two preceding. The result of this analysis was as follows:

Felspar of the blue rock, from Quarryville, 3 miles N. E. of Wilmington.

Colour smoky gray, translucent; powder nearly white. Fracture in mass irregular, coarse-grained; that of distinct portions rhomboidal. This variety of felspar exhibits, sometimes, a slight but indistinct play of colours. Specific gravity in piece, 2.603, temp. 70° F.

Composition in 100 parts.

		Oxygen.		
Silica	66.51	34.55		
Alumina	17.67	8.25	8.66	11.56
Peroxide of Iron	1.33	0.41		
Magnesia	0.30	0.116	2.897	
Lime	1.24	0.347		
Soda	3.03	0.774		
Potassa	9.81	1.660		
	99.89			

In comparing this result with the two former, Mr. Boyé observed, that this felspar approaches, in composition, more nearly to the first of the others; but, that a small portion of the potassa is replaced by lime, to which latter, and the oxide of iron, it probably owes its higher specific gravity. To these two ingredients, as well as to the full proportion of silica which it exhibits, ($3\times11.56=34.68$,) may be referred the indestructibility and other superior qualities which are ascribed to this variety.

Mr. B. closed his remarks by mentioning the recently published report of Professor Booth, on the geology of Delaware, as presenting a detailed and interesting notice of these several rocks.

Mr. Lea submitted to the examination of the members, a volume containing two hundred specimens of photogenic drawings of the plants in the vicinity of Philadelphia, by his son, Mr. Carey Lea.

Prof. A. D. Bache laid before the Society a diagram representing the direction and force of the wind, and the amount and rate of fall of the rain, during the severe gust of April 2d.

The diagrams were copies of the register kept at the Philadelphia Magnetic Observatory, at the Girard College, traced by the self-registering anemometer. The bi-hourly register of the barometer showed, that the pressure diminished from early in the morning to the time of the observation next preceding the gust, at the rate of about .09 of an inch every two hours. The wind during the day was generally from the S., and light, veering in the afternoon, occasionally nearly to S. by W. Between $6h\ 7m$, P. M. and $6h\ 20m$, it had changed from S. to N. W. by W., and the pressure between $6h\ 14m$ and $6h\ 21m$ increased from 0 to 20 lbs. avoirdupois, upon the square foot. Rain began to fall about $6h\ 15m$, the wind having at that time reached the W. in direction, with a force of less than $\frac{1}{4}$ of

a lb. to the square foot. The fall of rain was not remarkable. The extreme force of the gust was at its beginning, the pressure declining in 15*m* from 20 to 15 lbs. and reaching $3\frac{1}{3}$ lbs. at 7*h* 10*m*, when it again increased. At the regular observation of the barometer, about twenty minutes past 6 o'clock, the wind having then the direction of N. W. by W. and a force of nearly 20lbs., the barometer stood at 29.548 inches, (corrected,) the temperature of the air being 50°, and the elastic force of vapour calculated from the evaporating point, and temperature being 0.357 inches. The rise of the barometer between the 4 and 6 o'clock observations, had been but .06 of an inch, and the pressure continued to increase during the night. The force of this storm is almost exactly that assigned in the table attached to the report of the Committee of Physics of the Royal Society of London, to a "great storm." It is to be regretted that an observation was not taken immediately preceding the storm, to know if there was a sudden fall of the barometer at that period.

Prof. Bache also described to the Society a modification of the part of Ostler's self-registering anemometer, which measures the force, made by Mr. S. W. Hall, first assistant at the Magnetic Observatory at the Girard College, and applied to the instrument there.

It consists in substituting slightly curved bars or nearly flat springs attached to the table or frame of the registering part of the instrument, for the spiral springs applied in the original instrument behind the plate which receives the impulse of the wind. One only of these springs acts in measuring the force of light breezes, and the second is brought into play in stronger winds. The sensibility of the instrument is much increased in winds below five pounds to the square inch, while the instrument retains the range of the original one. The friction of the apparatus necessary to guide the spring, and the exposure of the spring to the weather and to great fluctuations of temperature are avoided. The springs being in the recording room, their action may be observed at any time, and repairs or changes required may be readily made. The removal of a considerable weight from near the top of the vane and greater compactness are further advantages of this modification of the original plan. The springs actually used are of hammered brass.

Mr. Lea, on behalf of the Publication Committee, reported that all the papers which had been ordered to be published in the Transactions were in type.

Mr. Kane, Reporter, laid upon the table a copy of the Proceedings of the Society, No. 17, for March and April, 1841.

Stated Meeting, May 21.

Present, twenty-five members.

Mr. Du Ponceau, President, in the Chair.

Mr. Peter, a member elect, was introduced, and signed the Laws.

Letters were read—

From William Peter, Esq., dated 10th May, 1841, making acknowledgments for the honour of his election to membership:—

From Josiah Quincy, President of Harvard University, dated 6th May, 1841, acknowledging, on behalf of the corporation, the receipt of Vol. VII. Part 3, of the Transactions:—

From the Corresponding Secretary of the Georgia Historical Society, dated Savannah, 20th Jan. 1841, communicating the appointment of Dr. William B. Stevens as historian of the State of Georgia, and asking access for him to any historical documents in the library of the Society.

On motion of Mr. Kane, it was resolved, that Dr. William B. Stevens, of the Georgia Historical Society, be allowed the unrestricted use of the library of the Society; and the Committee on the Historical Sciences was instructed to inquire whether there are any documents in the Society's collections which may elucidate the early history of Georgia, and to communicate with Dr. Stevens in regard to them.

The following donations were announced:—

FOR THE LIBRARY.

Flora Batava, of Afbeelding en Beschryving van Nederlandsche Gewassen, &c., 121 aflevering. 4to.—*From His Majesty, the King of the Netherlands.*

Mémoire sur la Bibliothèque Royale, &c. Paris, 1835. 4to.—*From Mr. John Penington.*

Second Mémoire sur la Bibliothèque Royale, &c. Paris, 1838. 4to.—*From the same.*

Institut Royal de France. Annuaire pour 1841.—*From Mr. D. B. Warden.*

Société Royale et Centrale d'Agriculture. Bulletin des Séances, Compte-rendu mensuel. No. 18, Juin et Juillet, 1840. No. 19, Août et Septembre, 1840. 8vo.—*From the same.*

Recherches sur l'Histoire et l'Origine des Foulahs ou Fellahs, par M. Gustave d'Eichthal. 1840. 8vo.—*From the Author.*

Première Note sur la nécessité de repousser, ou d'ajourner le projet de loi sur les Fortifications de Paris, &c., par Jullien de Paris, &c. &c. Paris, 1841. 12mo.—*From the Author.*

Fortifications de Paris, &c. &c. Seconde Note de M. Jullien de Paris, &c. Paris, 1841. 12mo.—*From the same.*

Report of the Commissioners under the Act of Congress of 20th July, 1840, for the purpose of Exploring and Determining the Boundary Line between the States of Maine and New Hampshire, and the British Provinces. Jan. 1841. Washington. 8vo.—*From the Commissioners.*

Report to the Secretary of State for the Home Department, from the Poor Law Commissioners, on the Training of Pauper Children; with Appendices. London, 1841. 8vo.—*From Mr. Frederick A. Packard.*

Proceedings of the Academy of Natural Sciences of Philadelphia. No. 1. March and April, 1841. 8vo.—*From the Academy.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. I. May, 1841. No. 5. 8vo.—*From the Institute.*

A Discourse delivered before the Georgia Historical Society, on Friday, 12th Feb. 1841. By William Bacon Stevens, M.D. Savannah, 1841. 8vo.—*From the Society.*

A Biographical Memoir of Commodore Joshua Barney, &c. Edited by Mary Barney. Boston, 1832. 8vo.—*From Mr. Du Ponceau.*

Researches, Philosophical and Antiquarian, concerning the Aboriginal History of America. By J. H. M'Culloh, Jun., M.D. Baltimore, 1829. 8vo.—*From the same.*

The Committee, consisting of Mr. Walker, Dr. Patterson, Professor Alexander, Major Graham, and Captain Talcott, to which was referred, on the 16th April last, the letter of Mr. Simeon Borden, giving an account of his trigonometrical survey of Massachusetts, and a comparison of its results with

those effected by Mr. Paine's chronometrical survey of the same state, reported in favour of its publication among the Transactions of the Society, which was ordered accordingly.

Mr. Borden's paper gives an abstract of the principal results of the Trigonometrical Survey of Massachusetts, begun in the year 1831, and recently brought to a conclusion. It also gives a comparison of these results with those obtained by Robert Treat Paine, Esq., from observations with a Troughton's sextant and mercurial horizon, and chronometers transported to different stations.

The base line chosen for the Massachusetts survey, was on the Connecticut river, above Northampton; it was 7.388 miles long. The apparatus with which it was measured, was devised by Mr. Borden. It was fifty feet in length, and constructed on compensating principles. The measurement was marked by sections of 1000 feet, and was tested by a remeasurement in an opposite direction. The sum of the discrepancies, without regard to signs, between 25 spaces measured for 1000 feet each from N. to S., and the same spaces measured from S. to N., was 3.567 inches; making an average discrepancy of 0.14268 of an inch; and the first measurement of the entire base exceeded the second in length by 0.237 of an inch. The standard of length first selected, was a scale of two feet, constructed upon compensating principles, and of course unsuitable for subdivision. Being afterwards compared at Washington, by Mr. Hassler, Superintendent of the United States' Coast Survey, with his 82 inch scale of Troughton's construction, and which is an exact copy from the well known Troughton scale of Sir George Shuckburgh, it was found to be 0.0018 inches too short, at the temperature of 57°.5 Fah. But a part of the triangles having been, previous to this comparison, computed according to the Massachusetts scale, it was thought best to complete the calculations in the same manner, and make correction afterwards, when the proper standard should be fixed upon. For this standard, Mr. Borden chose Hassler's 82 inch Troughton at the temperature 62° Fahr. A trial base was not measured, and was not deemed indispensable, as the principal stations will ultimately be connected with those of the coast survey, and referred to Mr. Hassler's base.

The height of the stations above the sea-level was determined from comparison with a principal station on Fay's Mountain, situate in the town of Westboro', about thirty miles nearly west of Boston; the height of which was ascertained from levels carried forward, by means of vertical triangles, from five points of tide water, viz: at

Marblehead, Nahant, Marshfield, Hyannis, a village in the town of Barnstable on the south side of Cape Cod, and Bullock's Neck on the east side of Seekonk or Providence river. The extreme results differed less than one foot, though the stations embrace a distance of seventy or eighty miles of sea-coast. The point chosen for the mean height of the sea, was half way between high-water and low-water, as observed on the same day; care being taken to repeat the observation on days when the sea had been for some time (apparently at least) without agitation by high winds or storms.

After applying the reductions for the sea-level, and the standard length and temperature, the following results were obtained for the length of a degree of the meridian.

No.	Names of Stations.	Mr. Paine's Latitude.	Middle Latitude.	Deg. of Meridian in English ft.
	Station of Comparison, Harris Street Church, Newburyport, . .	° ′ ″ 42 48 32.1		
			° ′ ″	
1	Nantucket South Tower, . .	41 16 56.0	42 2 44.05	364313.17
2	Holmes' Hole Windmill, . .	41 27 15.3	42 7 53.70	389.25
3	New Bedford Mariners' Church, .	41 38 6.3	42 13 19.20	348.25
4	Barnstable Court House, . .	41 42 7.3	42 15 19.70	420.25
5	Sandwich Church, . . .	41 45 31.0	42 17 1.55	357.10
	Station of Comparison, Salem East India Marine Hall, . . .	42 31 18.9		
6	Nantucket South Tower, . .	41 16 56.0	41 54 7.45	364253.76
7	Holmes' Hole Wind Mill, . .	41 27 15.3	41 59 17.10	340.59
8	New Bedford Church, . .	41 38 6.3	42 4 42.60	279.42
9	Sandwich Church, . . .	41 45 31.0	42 8 24.95	274.76
10	Barnstable Court House, . .	41 42 7.3	42 6 43.10	447.68
	Station of Comparison, Highland Light, Cape Cod, ...	42 2 22.2		
11	Nantucket South Tower, . .	41 16 56.0	41 39 39.10	364385.00
	Station of Comparison, St. Ann's Church, Lowell, . . .	42 38 47.6		
12	New Bedford Mariners' Church, .	41 38 6.30	42 8 26.95	364236.76
	Station of Comparison, Gloucester Church, ...	42 36 44.20		
13	Barnstable Court House, . .	41 42 7.30	42 9 25.75	364925.68
14	Nantucket South Tower, . .	41 16 56.00	41 56 50.10	594.00
15	New Bedford Mariners' Church, .	41 38 6.30	42 7 25.25	738.33
	Station of Comparison, Harris Street Church, Newburyport, . .	42 48 32.10		
16	Plymouth Court House, . .	41 57 28.50	42 23 0.30	364604.50

Rejecting the four last results in consequence of their difference from the mean, the others give the value of a degree of the meridian in English feet at the several middle latitudes as follows:

FIRST RESULT.			SECOND RESULT.		
No.	Middle Latitude.	Length of Degree.	No.	Middle Latitude.	Length of Degree.
	° ′ ″	Feet.		° ′ ″	Feet.
1)	42 2 44.05	364313.17	3)	42 13 19.20	364348.25
2)	42 7 53.70	389.25	4)	42 15 19.70	420.25
6)	41 54 7.45	253.76	5)	42 17 1.55	357.10
7)	41 59 17.10	340.59			
8)	42 4 42.60	279.42		3) 45 40.45	3) 1125.60
12)	42 8 26.95	236.76			
9)	42 8 24.95	274.76		42 15 13.48	364375.20
10)	42 6 43.10	447.68			
				THIRD RESULT.	
	8) 336 32 19.90	8) 2535.39	11)	41 39 39.10	364385.00
	42 4 2.48	364317.00			

In the absence of the necessary data, to reduce the values thus obtained to the same middle latitude, Mr. Borden referred for the occasion to the table in Rees's Cyclopædia, under the article Degree, which purports to give the value of meridional degrees of the terrestrial spheroid for every degree of latitude, supposing an ellipticity of $\frac{1}{334}$th of the equatorial radius; and which indicates 57 feet as the increase in the value of the consecutive degrees, from the 40th to the 43d of latitude. Applying this increase, by arithmetical progression, to each of the foregoing values of the meridional degree, he inferred from them a value corresponding with the middle latitude 42°; and with the values thus reduced, and giving to each value a weight proportionate to the number of comparisons on which it was based, he obtained 364334 feet for the length of a degree whose middle latitude is 42°. The length of a degree perpendicular to the meridian, at the latitude of the Boston State House, he found from the convergency of the meridians to be 365511.33 feet, which value also he adopted. Its accuracy was tested by applying the results of trigonometrical measurement to the differences of longitude ascertained by Mr. Paine's chronometrical observations. The following values of degrees perpendicular to the meridian were attained in the same manner:

		Feet
1)	From Boston State House and Northampton Church,	365177.60
2)	,, ,, and Plymouth Court House,	365653.00
3)	,, ,, and Amherst College Chapel,	365025.00
4)	,, Springfield Court House and Plymouth Court House,	365888.43
5)	,, ,, and Highland Light, Cape Cod,	365984.43
6)	,, Greenfield Church and Gloucester Church,	365420.76
7)	,, Boston State House and Pittsfield Church,	364193.11
8)	,, Plymouth Court House and ,,	364796.00
9)	,, Boston State House and Williamstown Church,	364519.42
	Sum of the first 6 results	6) 3149.22
	Mean of the first 6 results	365525.00

The three last of these results are rejected on account of their discrepancy from the mean. The astronomical observations for determining the longitude at Pittsfield and Williamstown are supposed by Mr. Borden to have been affected by mountain attraction; and he adopts the value of the degree perpendicular to the meridian as derived from the inclination of the meridians, in preference to the mean result given by this last table, in consequence of the discrepancies among its single results.

With the values of the meridional perpendicular degrees thus found, Mr. Borden calculated the equatorial radius, polar semi-axis, and ellipticity of the terrestrial spheroid, and the differences in value of the meridional degrees of 41° 21′ 30″, 42° 21′ 30″, and 43° 21′ 30″. His results are as follows:—

Meridional degree for the latitude of the State House, 364356 feet.

Perpendicular degree for the same latitude, 365511 feet.

Equatorial radius, 20914728 feet = 3961.123 miles.

Polar semi-axis, 20854128 feet = 3949.646 miles.

Ellipticity, $\frac{1}{345}$ nearly of the equatorial radius.*

Length of meridional degrees, the latitude of whose middle point corresponds to

°	′	″		Feet.		Difference.
41	21	30	=	364300.96		
					+	55.04 feet.
42	21	30	=	364356.00		
					+	55.22 ,,
43	21	30	=	364411.22		

* Combining the meridional degree measured in Peru in latitude 1° 30′ with the meridional degree measured in Massachusetts, they give an ellipticity of 1-313th nearly of the equatorial radius.

From the calculated differences in the value of these meridional degrees, it was apparent to Mr. Borden, that the increase of 57 feet to the degree, which he had adopted when preparing to deduce the value of the meridional degree from a combination of his proximate results, was not strictly accurate. But as the effect of the resulting error would scarcely have been appreciable, he did not deem it necessary to recalculate the work.

With the data already mentioned, Mr. Borden proceeded to determine the latitude of a *Cardinal* point, viz: the State House, Boston, by comparison with several of the principal stations, as follows:—

No.	Place compared with Boston State House.	Resulting latitude of Boston State House.
1)	New Bedford Mariners' Church,	42° 21′ 29″.81
2)	Harris Street Church in Newburyport,	29.70
3)	Salem East India Marine Hall,	30.37
4)	Saint Ann's Church in Lowell,	30.78
5)	Barnstable Court House,	31.04
6)	Sandwich Church in Sandwich,	29.94
7)	Highland Light House, Cape Cod,	28.78
8)	Nantucket South Tower,	28.95
9)	Holmes' Hole Windmill,	30.30
		9) 269.67
	Mean latitude of the State House	42° 21′ 30″.00
	Mr. Paine's Astronomical Result	42° 21′ 23″.03
	Discrepancy	6″.97

The results arrived at from these data by Mr. Borden, on the final reduction of the triangles of his survey, using for the latitude of the State House 42° 21′ 30″, and for its longitude, that which is given by Mr. Paine, 4*h* 44*m* 16*s*.6 west of Greenwich, are compared with the results of the chronometrical survey of Mr. Paine, in the following tables; which exhibit also the number of altitudes of the sun and north and south stars taken by Mr. Paine in determining the latitude of each station, and the number of journeys made by him with chronometers, and of the chronometers used by him on such journeys, in ascertaining its longitude.

LATITUDES.

No.	Place in which station is situated.	Name of Station.	Altitudes observed.	Paine's Latitudes.	Paine, north of Borden.
				° ′ ″	″
1	Boston	State House	442	42 21 22.70	—7.30
2	Amherst	College Chapel	109	42 22 12.60	—3.01
3	Barnstable	New Court House	267	41 42 7.30	+1.23
4	Cambridge	1st. Cong. Church	201	42 22 21.30	—7.81
5	Dedham	Do. do.	198	42 14 52.30	—5.00
6	Greenfield	Second do.	169	42 35 16.30	+1.50
7	Gloucester	1st. Independ't Ch.	113	42 36 44.20	—3.97
8	Holmes' Hole	Wind Mill West of Village	174	41 27 15.30	+0.43
9	Lowell	St. Ann's Church	300	42 38 47.60	+0.82
10	Monomoy Point	Light House	156	41 33 30.80	—4.20
11	Nantucket	South Tower'd Ch.	260	41 16 56.00	—0.62
12	New Bedford	Mariners' Church	322	41 38 6.30	—0.16
13	Newburyport	Harris st. Church	202	42 48 32.10	—0.05
14	Northampton	1st. Cong. Church	327	42 19 8.00	—1.44
15	Pittsfield	Do. do.	210	42 26 55.00	—0.61
16	Plymouth	Court House	169	41 57 28.50	+1.94
17	Providence, R.I.	University Hall	308	41 49 31.90	—3.58
18	Salem	E. Ind. Marine Hall	154	42 31 18.90	+0.48
19	Sandwich	1st. Cong. New Unita. Ch.	139	41 45 31.00	—0.09
20	Springfield	Court House	168	42 6 1.20	—2.41
21	Taunton	Trinitarian Ch.	181	41 54 8.30	—2.98
22	Truro	Cape Cod Lights	228	42 2 22.20	+1.16
23	Williamstown	Cong. Ch. near College	110	42 42 50.60	+1.46
24	Worcester	Antiquarian Hall	351	42 16 12.60	—4.44
25	Squam	Light	38	42 39 46.08	+2.56
26	Cape Ann	N. Light, Thatcher's Island	39	42 38 18.00	—3.78
27	Eastern Point	Light	36	42 34 48.00	—1.61
28	Baker's Island	Light	64	42 32 11.40	—0.60
29	Cambridge*	Harvard Observa. Transit	N. of Boston S. House,		52″.26
30	Dorchester*	Bond's Transit. Ins.	S. of do.		2′ 13″.41
31	Southwick*	Holcomb's House	S. of Springfield C. H.		5′ 13″.91

* Nos. 29, 30, and 31, are according to Mr. Borden's survey, not having been principal stations of Mr. Paine. Their connection with the survey is important, from their being the site of a series of independent astronomical observations by Mr. Bond and Mr. Holcomb, which, when reduced, will further test the precision of the two methods employed by Messrs. Paine and Borden.

LONGITUDES.

No.	Place in which station is situated.	Journeys with Chronometers.	No. of Chronometers used.	Paine's Longitudes.	Paine, west of Borden.
				° ′ ″	″
1	Boston	9	25	71 4 9.00	+ 0.00
2	Amherst	18	59	72 31 35.85	+ 7.36
3	Barnstable	6	20	70 18 36.00	+ 2.19
4	Cambridge	7	23	71 7 38.10	+ 9.25
5	Dedham	6	14	71 10 49.20	—10.08
6	Greenfield	16	60	72 36 31.95	+ 4.75
7	Gloucester	10	36	70 40 19.05	+ 1.88
8	Holmes' Hole	14	34	70 36 37.80	+ 0.22
9	Lowell	2	10	71 18 57.30	— 4.74
10	Monomoy Point	10	28	70 0 5.40	+ 9.16
11	Nantucket	18	54	70 6 12.15	— 1.73
12	New Bedford	16	46	70 55 49.35	+ 4.96
13	Newburyport	24	74	70 52 47.10	+ 5.80
14	Northampton	13	39	72 38 21.00	+ 6.06
15	Pittsfield	10	33	73 16 5.10	+28.98
16	Plymouth	11	40	70 40 27.60	+ 8.33
17	Providence, R.I.	14	42	71 24 48.00	+13.59
18	Salem	13	38	70 53 56.70	+ 3.67
19	Sandwich	16	51	70 30 27.00	+13.81
20	Springfield	12	36	72 35 47.25	+ 2.31
21	Taunton	7	24	71 6 4.50	+ 9.47
22	Truro	10	28	70 4 8.70	+13.37
23	Williamstown	15	45	73 13 19.50	+19.24
24	Worcester			71 48 10.20	+ 2.84
25	Squam	2	14	70 41 8.00	— 4.31
26	Cape Ann	2	14	70 34 44.00	— 4.05
27	Eastern Point	By bearing from Gl	oucester Pt.	70 40 12.75	+ 1.90
28	Baker's Island	2	14	70 47 37.00	+ 8.59
29	Cambridge*	W. of State House, Boston		3 6.42	
30	Dorchester*	W. of do.		11.24	
31	Southwick*	W. of Springfield Court House,		12 59.86	

* See note on preceding page.

The mode of determining the topography of a state, of which Mr. Borden's paper gives the first account, is recommended by its economy and expedition, as well as by the very adequate accuracy of its results. The survey of Massachusetts, including 8230 square miles of territory, and having an indented sea coast of about 300 miles, has been completed by Messrs. Borden and Paine, in little more than ten years, and at an expense of 61,322 dollars.

Dr. Hays read a note to the report of the Committee, consisting of Dr. Horner and himself, on the Mastodon bones in the Society's possession; which was ordered to be published in the Transactions, with the report of the Committee.

Dr. Hays announced the death of Dr. William P. Dewees, a

member of the Society, on the 18th instant, aged 74; and on his motion, Dr. Hugh L. Hodge was appointed to prepare an obituary notice of the deceased.

Mr. Kane announced the decease of Don Jose da Silva Lisboa, of Rio Janeiro, a member of the Society.

Mr. Du Ponceau announced the decease of Count Miot de Melito, of France, a member of the Society, which occurred on the 15th of January last.

Mr. Lea called the attention of the Society to a beautiful living specimen of the Bulimus Ovatus, which he had received through Mr. Stern Humphreys, from Brazil, and made some remarks on its distinctive character and habits.

Mr. Walker read a letter from Professor Forshey, of Natchez, giving an account of several interesting displays of meteors.

Mr. Walker observed, that the display of the 20th of April, which was noticed in Virginia in 1803, and which has been referred to by MM. Arago, Quetelet, Herrick and others, was watched for by Mr. Herrick in the three last years, without any remarkable result. Corresponding observations were made in the present year at Cambridge, New Haven, Philadelphia and Washington, on the 19th; the 20th and 21st being cloudy, from 11 o'clock till midnight; but the number of meteors seen was not greater than usual. In the morning of the 19th, however, a gentleman of Philadelphia, Mr. William F. Kintzing, counted eight in the course of ten minutes, shortly after midnight.

At about 8 o'clock on the same night, the 18th, at Vidalia, in Louisiana, Prof. Forshey noticed an unusual number of meteors in different parts of the heavens, and on tracing their paths backwards, found that they traversed the Constellation Virgo. Having commenced precise observations at half past 8, and continued them for three hours, he saw in two hours and a quarter, forty-five minutes being lost in recording, sixty meteors, of which, all but five, passed within 10° from the common radiant point. These meteors were very unlike those of the August shower; being chiefly without trains, and of a reddish colour, few of them of the first magnitude, and the greater number of the third and inferior magnitudes. Their velocities were remarkably equal and gentle; their paths short; and their light first increasing, then waning, as if they were moving on a chord to the circle of visibility. Professor Forshey determined their radiant

point to be in a line drawn from Spica to θ Virginis, somewhat nearer to Spica, say in R. A. 198°, S. Decl. 8°. The convergent point was, therefore, in long. 19°.6, and lat. N. 0°.3, while the observer's motion was towards a point of the ecliptic in long. 299°. This gives a deflection of the path of the meteors, relatively to the true path of the observer, of 80°.6; and hence their true velocity cannot have been much less than that of the observer, or about sixteen geographical miles per second. This observation of the convergent point of these meteors, Mr. Walker regards as strongly confirmatory of the cosmical theory of shooting stars; inasmuch as it seems to demonstrate the existence in this group of a planetary velocity, like that of the December group observed by Mr. Herrick in 1838, in a direction normal to the observer's motion, and incapable of resulting from it.

Professor Forshey also observed the meteor shower of the 12th of November, 1833: he was then a cadet at West Point. While engaged, long before dawn, in preparing his morning recitation, his attention was caught by flashes of light at his window as if from lightning. The spectacle which met him on opening it, he describes as one of singular and fearful sublimity, the whole sky streaming with fire-balls, throwing a bright light upon the plain, and reflecting luridly against the mountains which enclose West Point. After a few minutes, finding no intermission in the display, he roused his associates to witness it; and the first sense of personal hazard yielding to the remark, that none of the meteors (meteorites, as he then supposed,) were actually descending into the plain, but that they became invisible before reaching the level of the mountains, he crossed the plain to awaken Professor Courtenay. While in company with this gentleman, he witnessed the magnificent meteor with a serpentine train, described by Professor Olmsted and others, and which has been called Twining's meteor, after the Professor who calculated its relative path and velocity. Both Professor Courtenay and himself noticed the white nebula which it left on exploding, and the beautiful silvery cloud that remained for some ten minutes after. He listened carefully, during the meteoric display, for the noises which are said sometimes to attend such phenomena, but could hear none; the explosion of the Twining meteor, he is confident, was not accompanied by an audible report.

Professor Forshey does not believe that the meteors of the 12th of November have the anniversary character. He has watched for them every year, except 1834 and 1836, since their appearance in

1833. He saw the great auroral arch of 17th Nov. 1835, from a point near the junction of the Ohio and Mississippi, and on the 14th November, 1837, he witnessed at Jefferson College a brilliant crimson arch, a rare phenomenon in that latitude, 31° 36′. He noticed, also, occasional brilliant meteors on the 13th and 14th of November, 1837, but they did not appear to come from the well known radiant point of 1833, in Leo. The times for observation in 1838 and 1839 were too cloudy to allow of satisfactory results. The subsequent anniversaries were clear, and well watched, but without any observation of interest.

Professor Forshey mentions that he had seen the zodiacal light in the west, from December to May, but that he first witnessed it in the east, on the 4th of October of last year, when it continued in great brilliancy from 3 A. M. till daylight.

Professor Bache communicated to the Society a statement of the Observations made for the year past at the Magnetic Observatory at the Girard College, and exhibited the original records, the abstracts made from them, the calculated results, and the curves by which they are represented. He reminded the members that in consequence of the depressed state of the Society's funds in May last, it had been judged inexpedient to ask for the appropriation of any part of them to the object of these observations; and he mentioned the names of ten members of the Society, and of three gentlemen, not members, Messrs. Richard Price and J. D. Brown, of Philadelphia, and Professor M'Lean, of Princeton, by whose liberality the Observatory had been supported during the year.

After some remarks from Mr. Walker, describing the results which have been arrived at by the labours of Gauss, Weber and others, in magnetism, and referring to the practical value to navigation of the magnetic investigations now making, Dr. Chapman pressed upon the Society the importance of continuing the magnetic and meteorological observations in the combined series which is now in the course of execution:—and on his motion, a committee was appointed to devise means for continuing the observations at the Girard College Observatory during the remaining two years of the series.

The Committee, consisting of Mr. Du Ponceau, Dr. Patterson, and Mr. Vaughan, to which was referred, on the 16th of

April, the letter from the President of the Royal Society of Sciences, Agriculture and Arts, of Lille, reported in favour of entering into correspondence with that Institution and interchanging with it the Transactions and other publications of this Society; and the Secretaries and Librarian were instructed accordingly.

Mr. Lea laid on the table several volumes of the Transactions of the Natural History Society of Northumberland, Durham, and Newcastle upon Tyne, England, for which he invited the Society to exchange a copy of its publications. On motion, the Librarian was instructed to make the proposed exchange.

Stated Meeting, June 18.

Present, twenty-seven members.

Dr. PATTERSON, Vice-President, in the Chair.

Mr. Gilliss, a member of the National Institution at Washington, was introduced as a visiter.

Letters were received—

From the Secretary of the Cambridge Historical Society, England, dated 17th Nov. 1838, acknowledging the receipt of Vol. VI. N. S. of the Transactions of this Society, and of the Second Volume of the Transactions of the Historical and Literary Committee:—

From the Secretary of the American Academy of Arts and Sciences, dated Boston, 25th May, 1841, acknowledging the receipt of three Parts of the Transactions and one number of the Proceedings:—

From Mr. J. Francis Fisher, dated 17th June, 1841, presenting to the Society some rare Tracts, by Cotton Mather.

The following donations were announced:—

FOR THE LIBRARY.

Institut de France. Mémoires de l'Académie Royale des Sciences. Tomes XIII. XIV. XV. XVI. XVII. Paris, 1835—1840. 4to. *From the Institute.*

Mémoires presentés par divers Savants à l'Académie Royale de France, Institut de France. Tomes V. VI. Paris, 1835—1838. 4to.—*From the same.*

Institut de France. Mémoires de l'Académie des Inscriptions et Belles-lettres. Tomes XI. XII. XIII. Paris, 1835—1839. 4to. *From the same.*

Rapports du Secrétaire perpétuel de l'Académie Royale des Inscriptions, &c. sur les travaux des Commissions pendant le 2me Sem. 1840. 4to.—*From the same.*

Notices et Extraits des Manuscrits de la Bibliothéque du Roi, &c. publiés par l'Institut, &c. Tome XIII. Paris, 1838. 4to.—*From the same.*

Société de Géographie. Recueil de Voyages, &c. Tome VI. Géographie d'Edrisi. Tome II. Paris, 1840. 4to.—*From the Society.*

Mémoires de la Société Royale des Antiquaires du Nord, 1836—1839. Copenhagen. 8vo.—*From the Society.*

Annaler for Nordisk Olkindighed adgione af det Kongelige Nordiske Oldscrift selskab, 1838. Copenhagen. 8vo.—*From the same.*

Royal Society of Northern Antiquaries. Reports of the General Anniversary Meetings in 1838 and 1839. Copenhagen, 1839. 8vo.—*From the same.*

Transactions of the Society for the Encouragement of Arts, Manufactures and Commerce, during the Session of 1839-40. Vol. LIII. Part 1. 8vo.—*From the Society.*

Proceedings of the Geological Society of London. Vol. III. Part 2. Nos. 72 to 75. 1840-41 8vo.—*From the Society.*

List of Members, &c. March 1, 1841.—*From the same.*

Transactions of the Cambridge Philosophical Society. Vol. VI. Part 3. Cambridge, 1838. 4to.—*From the Society.*

Journal Asiatique, ou Recueil, &c. publié par la Société Asiatique. IIIe. Sér. Tome X. Nos. 55 to 60. Sept. 1840 to Feb. 1841. 8vo.—*From the Society.*

Mémoires de la Société Royale des Antiquaires de France. N.S. Tome V. 1840. 8vo.—*From the Society.*

Proceedings of the Royal Astronomical Society. Vol. V. Nos. 12, 13. Feb. and Mar. 1841. 8vo.—*From the Society.*

Annales des Mines. 3éme. Sér. Tome XVII. 3éme. Livrn. de 1840. Paris. May, June, 1840. 8vo.—*From the Engineers of Mines, Paris.*

Résumé des Travaux Statistiques de l'Administration des Mines en 1838. Paris, 1839. 8vo.—*From Mr. Moncure Robinson.*

Statistique des Ports maritimes de Commerce. Paris, 1839. Fol. *From the same.*

Ponts et Chaussées. Situation des travaux au 31st Dec. 1838. Paris, 1839. 4to.—*From the same.*

Tableau Général du Commerce de la France, &c. pendant les années 1837, 1838. Paris, 1838-9. 2 Vols. Fol.—*From the same.*

Tableau Général des mouvements du Cabotage pendant l'année 1837. Paris, 1838. Fol.—*From the same.*

The Four Books or Classics of the Chinese, in the original, with a Commentary. 6 Vols. Gutzlaff's Magazine in Chinese. 1st Ser. Vols. I. II. The Gospels, Acts and Epistles in Javanese. 4 Vols. The New Testament, in Arabic. The New Testament, in Hindoosthanee. The Holy Bible, in Bengalee. The Gospel of St. Luke, in Canarese, dialect of Bengal. The Life of the Saviour, in Birmese. The Acts of the Apostles, in Siamese. The Acts, in Hinduwee. Summary of the Scriptures, in Murathee, of the Bombay Presidency. The Child's Book on the Soul, in the same. An Account of various Animals, in the same. The New Testament, in Goozuratee. The New Testament, in Tamul. The New Testament, in the language of the Sandwich Islands. The Holy Bible, in Malay. The New Testament in the same. 27 Vols.—*From Mr. J. Henshaw Belcher.*

The Ceylon Government Gazette, for the years 1834, 1835. 2 Vols. Fol.—*From the same.*

The Papers of James Madison, published by authority of the Congress of the U. S. under the Superintendence of Henry D. Gilpin. Washington, 1840. 3 Vols. 8vo.—*From the Hon. Henry D. Gilpin.*

The Journals of Congress, 1774 to 1778. Philadelphia, 1777—1778. 12 Vols. 12mo—*From the same.*

General Index of the Laws of the U. S. from 1789 to 1827, compiled by Samuel Burch. Washington, 1828. 8vo.—*From the same.*

Account of the Receipts and Expenditures of the U. S. for the year 1826. Washington, 1827. Fol.—*From the same.*

The Public Works of the United States. Edited by William Strickland, Edward H. Gill and Henry R. Campbell. Parts 1 and 2. London, 1841. Fol.—*From Mr. William Strickland.*

Reports, Specifications, &c. of the Public Works of the United States.

Edited by William Strickland, &c. London, 1841. 8vo.—*From the same.*

Prospectus, Specimens, and Catalogues of the Publications of M. M. Vandermaelen and Meisser. Brussels, 1841. 8vo.—*From the Editors.*

London Provident Institution. Annual Report, February, 1841, and Account of Receipts and Expenditures from 16th July, 1816 to 20th Nov. 1840.—*From Mr. William Vaughan.*

The American Medical Library and Intelligencer. Vol. IV. No. 24. By Robley Dunglison, M.D. &c. &c.—*From the Editor.*

Journal of the Franklin Institute. Vol. I. N. S. No. 6. June, 1841.—*From the Institute.*

A Commentary and Review of Montesquieu's Spirit of Laws, &c. &c. By Destutt Tracy. Philadelphia, 1811. 8vo.—*From Mr. Du Ponceau.*

A Monograph of the Limniades of North America. No. 2, Jan. 1841. By S. Stehman Haldeman, &c. &c.—*From the Author.*

Eleven Tracts by the Rev. Dr. Cotton Mather. Boston, 1699 to 1725. 12mo.—*From Mr. J. Francis Fisher.*

Remarks on Currency and Banking, by Nathan Appleton. Boston, 1841. 8vo.—*From Mr. Dexter Stone.*

Some Observations on the Situation, &c. of the Indian Natives of this Continent. Philadelphia, 1784. 12mo.—*From Mr. John Jordan.*

Fifteenth and Seventeenth Annual Reports of the American Sunday School Union. Philadelphia, 1839, 1841.—*From Mr. F. A. Packard.*

Letter to the Governor of Pennsylvania in relation to the Public Schools of England. Harrisburg, 1841. 8vo.—*From the same.*

Twenty-fifth Annual Report of the Directors of the American Asylum, &c. for the Deaf and Dumb. Hartford, 1841. 8vo.—*From Mr. Lewis Weld.*

Address before the Directors of the Public Schools, by James J. Barclay, President, &c. Philadelphia, 1841. 8vo.—*From the Author.*

Thirteenth Annual Report of the House of Refuge of Philadelphia. 1841. 8vo.—*From the same.*

Sixth, and Ninth to Fifteenth Annual Reports of the Boston Prison Discipline Society. 1831 to 1840. 8vo.—*From Mr. Louis Dwight.*

List of Donations to the Albany Institute, (Albany Daily Advertiser, 3d June, 1841.)—*From the Institute.*

Specimen of Printing Types, &c. cast by Johnson & Smith. Philadelphia, 1841. 8vo.—*From the Publishers.*

Charts. 1. A Chart of Pensacola Harbour and Bar, Florida, by Lieut. Col. James Kearney, U. S. Top. Engineers, from a Survey in 1822. 4 Sheets. 2. A Chart of Core Sound, North Carolina, in 1837, by the same. 3. Four Charts, portions of the preceding Chart, on an enlarged scale. 4. A Chart of part of Sandusky Bay, &c. in 1826, by Lieut. Campbell Graham, U. S. A. copied on a reduced scale. 1838.—*From Major James D. Graham.*

FOR THE CABINET.

Dried Specimens of Western and Southern Plants.—*From Dr. Charles W. Short, of Louisville, Kentucky.*

An Engraved Portrait of Dr. Philip Tidyman, by T. B. Welch.—*From the Engraver.*

The Committee, consisting of Dr. Patterson, Professor Bache, and Professor Vethake, to whom was referred a paper, entitled "On the Expansion of $F.(x + h)$" by Pike Powers, Esq. of the University of Virginia, reported in favour of its publication in the Transactions; which was accordingly ordered.

The paper of Mr. Powers consists of a new investigation of Taylor's Theorem. The only postulates assumed are, first, "that there are no functions, which throughout their whole range of values, change incessantly from increase to decrease, as x varies, and that by quantities greater than the change in x;" and, secondly, "that there are no functions, which, while they undergo a constant increase or decrease through finite intervals of value, yet always receive an infinite change for a finite change in x." On these data the demonstration of Mr. Powers is founded; but it is not of a nature to admit of an abstract.

A communication was received, entitled "Description of a New Form of a Transportable Original Barometer, and the Method of constructing and using the same, by F. R. Hassler;" which was read and referred to a committee.

Mr. Lea presented a continuation of his paper on Fresh Water and Land Shells; which was read and referred to a committee.

Professor Bache mentioned that he had received, for the Society, from our fellow member, Mr. Rümker, Director of the Observatory at Hamburg, under date of the 18th of March, 1841, a list of observations, made by him at Hamburg, of the last comet of 1840. The observations are as follows:—

1840.	Mean Time at Hamburg.			Apparent AR of Comet.			Apparent Declination of Comet.		
Oct. 31	8	22	0.08	19	0	39.467	60	55	28.69
Nov. 1	6	52	26.82	19	5	43.216	60	54	31.48
2	10	28	10.86	19	12	4.756	60	52	7.84
3	7	15	19.82	19	17	2.979	60	50	33.74
4	13	20	2.14	19	24	28.450	60	46	31.34
5	6	57	8.31	19	28	56.872	60	43	16.11
9	8	21	27.13	19	56	59.328	60	21	30.63
11	6	55	59.20	20	8	40.337	60	0	48.52
12	6	27	11.41	20	15	41.102	59	50	3.76
13	8	5	4.80	20	23	26.385	59	36	5.27
14	9	29	42.97	20	31	14.402	59	21	18.39
15	6	41	14.84	20	37	50.215	59	7	7.50
18	6	34	54.83	21	0	40.717	58	9	58.25
19	6	48	36.13	21	8	29.169	57	47	16.72
20	6	25	23.65	21	16	6.285	57	23	14.93
24	6	44	42.53	21	47	13.882	55	26	0.50
25	6	25	2.60	21	54	47.306	54	52	15.69
	13	41	46.60	21	57	7.628	54	42	19.72
26	7	9	17.20	22	2	38 673	54	15	27.30
29	7	33	59.12	22	25	6.281	52	15	46.65
Dec. 2	9	11	4.79	22	46	56.829	49	58	3.17
3	7	7	2.82	22	53	12.672	49	13	42.05
	8	49	21.41	22	53	42.254	49	10	52.41
6	6	56	47.26	23	12	59 638	46	43	49.08
13	7	42	40 03	23	54	19.495	40	19	3.31
14	7	0	57.18	23	59	29.358	39	24	18.23
15	6	17	45.63	0	2	52.297	38	29	7 03
16	8	50	43.24	0	10	6.085	37	27	56.16
18	7	34	23.16	0	19	31.004	35	39	31.85
19	8	47	55.91	0	24	25 567	34	41	30.99
21	8	2	41.39	0	33	15.525	32	54	42 36
23	7	58	57.91	0	41	47.577	31	8	36.33
25	7	42	27.06	0	49	52 085	29	26	8.12
	10	34	11.99	0	50	21.596	29	20	56.22
26	8	8	10.01	0	53	51.430	28	34	51.10
27	9	31	19.89	0	57	55.670	27	43	41.96

Nov. 19, at 7 46 50, mean time, the comet passed over a small star, in AR 21 8 51.280, Dec. 57 46 27.32 N.

Dr. Mitchell presented to the Society a short abstract of a paper, read by Dr. S. Brown, of Edinburgh, before the Royal Society of that city, on the subject of the apparent isomerism of silicon and carbon, and of iron and rhodium.

The proof sheets of this paper were sent by Mr. Combe, of Edinburgh, to Dr. Hare, in consequence of whose absence from Philadel-

phia they passed into the hands of Dr. Mitchell. Dr. M. promised to repeat some of the experiments of Dr. Brown, and to lay the results before the Society at a future meeting.

Professor Park noticed a new publication, recently announced, from the Geographical Institute at Brussels, by Messrs. Vandermaelen and Meisser, under the title of "Epistémonomie, ou Tables Générales d'Indications des Connaissances Humaines."

He observed, that its professed object is to give analytical references to all works, whether books, pamphlets, or articles in periodicals, on each respective subject of human knowledge. He expressed his regret, that in the specimen list which was forwarded to this Society, comprising the works on rail roads, those published in our own country appeared to be so generally neglected. He also remarked, that though the plan of the authors required a classification of human knowledge, they had united in one of twelve divisions, the subjects of mental and moral philosophy, religion, law and government, history, biography, languages and antiquities, although these cover nearly one-half of universal literature. Prof. Park announced a more equable and natural classification as about to be published, in which all human knowledge is primarily divided into the following four provinces:—1. *Psychonomy*, or the Laws of Mind, comprising the Study of Languages, Metaphysics, Jurisprudence, and Religion: 2. *Ethnology*, or the Study of Nations and Society, comprising Geography, History, Biography, and Poetry: 3. *Physiconomy*, or the Laws of the Material World, comprising Mathematics, Physics, Natural History, and Medicine: and 4. *Technology*, or the Study of the Physical Arts, including those of Construction, with Agriculture, Manufactures and Commerce, War, and the Fine Arts, particularly Painting, Sculpture and Music, and other subordinate subjects.

Mr. Lea, from the Publication Committee, presented a report on the state of the Committee's accounts, upon the completion of the 7th volume, New Series, of the Society's Transactions.

The Committee mention, that the expense of publishing this volume is about $1640, and that the balance remaining in their hands applicable to the publication of Vol. VIII., a part of which is already in press, is $166.38, besides about $600 which will probably be collected from subscribers for the preceding volumes.

The Committee, consisting of Dr. Chapman, Dr. Patterson, and Mr. Richards, which was appointed at the last meeting to devise means for completing the magnetic and meteorological observations which have been in progress during the past year, presented their report; and the recommendations of the Committee being under consideration, the Society adjourned to Friday evening the 25th instant.

Adjourned Meeting, June 25.

Present, thirty-five members.

Judge Hopkinson, Vice President, in the Chair.

The Society resumed the consideration of the report which was under discussion at the adjournment of the last meeting.

In this report the Committee review the history of the concerted observations first proposed by the Royal Society of London in 1839, and refer to the action of this Society in consequence of the circular from that learned body. They express the strongest confidence in the skill, assiduity, and success, with which the operations of the magnetic observatory at Girard College have been thus far conducted, and a belief that their prosecution is called for by the honour of the Society. They pledge themselves, that as the funds required for the past year's expenditure have been furnished by individual contributions of the members and their friends, so those for the third year shall be supplied in like manner, if the Society will defray the charges of the intervening period from its corporate funds.

After a full discussion of the subject, resolutions were adopted by the Society—1. Directing the Committee on the Observatory to ask permission from the City Councils of Philadelphia to constitute, from certain moneys heretofore paid by the city, a fund for the promotion of astronomical and magnetic researches, and the publication of the results thereof: 2. Authorizing the Committee to refund, if required, certain

contributions made by individuals to the Astronomical Fund; and 3. Directing the trustees of that fund to supply the means of completing the magnetic and meteorological observations on certain terms and conditions.

NOTICE.

Members qualified to vote at the elections of the Society, Societies in correspondence with it, and Subscribers for its Transactions, are entitled to receive copies of the "Proceedings" at the times of their publication. Others desiring to receive them, are respectfully informed that the subscription price has been fixed at one dollar per annum, to be always remitted to the Treasurer in advance.

Those copies which are intended for distribution in foreign countries, will be transmitted in such manner as may be indicated by the parties to whom they are addressed: those for Philadelphia and other parts of the United States, by the medium of the post office. The Reporter will, however, retain them, if so directed, and will attend at the Hall on Friday evenings to deliver them in person. He particularly solicits that every irregularity occurring in the distribution may be communicated to him promptly, as it may not otherwise be practicable for him to supply missing numbers. The earlier part of the first volume has been for some months out of print.

Hall of the American Philosophical Society,
Philadelphia, 26th June, 1841.

ERRATUM—In No. 17, at page 43, in the fifth line, for "produce," read "precede."

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. JULY, AUG. SEPT. & OCT. 1841. No. 19.

Stated Meeting, July 16.

Present, thirty-one members.

Mr. DU PONCEAU, President, in the Chair.

Letters were received and read:—

From Dr. Robert Christison, of Edinburgh, dated June 4, 1841, and from Prof. Edward Hitchcock, of Amherst, dated July 10, 1841, making acknowledgments for the honour of their election as members:—

From V. Cousin, Minister of Public Instruction of France, dated Paris, 23d October, 1840, announcing the transmission to the Society of a copy of the Archives du Muséum d'Histoire Naturelle:—

From M. Paris, President of the Royal Society of Antiquaries of France, dated Paris, 15th Jan. 1841, transmitting Vol. XV. of the Memoirs of that Society:—

From W. A. Graham, Secretary of the Society of Arts, &c. Adelphi, London, dated 14th June, 1841, acknowledging the receipt of Vol. VII. Part 2, of the Transactions, and Nos. 14, 15 & 16, of the Proceedings of the Society:—

From Frederick de Peyster, Corresponding Secretary of the New York Historical Society, dated 6th July, 1841, transmitting the first Volume of its Collections, N. S.:—

From Mr. George Folsom, dated 7th July, 1841, relating to certain publications of this Society, which are deficient in the library of the New York Historical Society:—

From Mr. W. W. Griffin, dated Elizabeth City, N. C. 11th

July, 1841, on the subject of the published Volumes of the Transactions.

The letter of Mr. Folsom was referred to the Library Committee, and that of Mr. Griffin to the Committee of Publication, with power to take order.

The following donations were announced:

FOR THE LIBRARY.

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais. Tomo I°. Numeros 13, 14, 15, 16, 17. Valencia, 1841. 8vo.—*From the Society.*

Collections of the New York Historical Society. Second Series. Vol. I. New York, 1841. 8vo.—*From the Society.*

A Discourse on the Life and Character of the Rev. Joseph Tuckerman. By William E. Channing. Boston, 1841. 8vo.—*From the Author.*

Pamphlets.—Trois Notes sur le Projet de Loi sur les Fortifications de Paris. Appel au bon sens National. La Voix de la France.—*From the Author, M. A. Jullien, de Paris.*

Monograph of the Limniades of North America. By S. Stehman Haldeman. No. 3. July, 1841. 8vo.—*From the Author.*

Tijdschrift voor Natuurlijke geschiedenis en Physiologie; uitgegeven door J. van der Hoeven, M.D. &c., en W. H. de Vriese, M.D. &c. Two numbers. 8vo. Leyden, 1841.—*From the Editors.*

Geschichte des Siebenjährigen Krieges in Deutschland von 1756 bis 1763, durch J. M. von Archenholtz, &c. Berlin, 1791. 12mo.—*From Mr. Du Ponceau.*

Kurzgefasste Lebensgeschichte Nicolaus Ludwigs, Grafen und Herrn von Zinzendorf und Pottendorf, von Jacob Christoph Duvernoy. Barby, 1793. 12mo.—*From Mr. John Jordan, Jun.*

Istruzione sui parafulmini, lettera del Sig. Ferdinando Elice, &c. &c. &c. Genoa, 1841. 8vo.—*From the Author.*

Noticia de un Cameleon Mineral, &c. &c. Por S. D. Andres del Rio, &c. &c. Mexico, 1839.—*From the Author.*

Fifth Geological Report of the State of Tennessee, made Nov. 1839. By G. Troost, M.D. &c. &c.—*From the Author.*

An Examination of Beauchamp Plantagenet's Description of the Province of New Albion. By John Penington. 1840. 8vo.—*From the Author.*

Scraps, Osteologic and Archaiological. By John Penington. 1841. 8vo.—*From the same.*

Reports of Dr. Beck, Mr. Conrad, Mr. Vanuxem, and others, on the Geological Survey of New York. 1841. 8vo.—*From Mr. L. Vanuxem.*

Journal of the Franklin Institute. July, 1841. 8vo.—*From the Institute.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. &c. &c. July, 1841. 8vo.—*From the Editor.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 1. July, 1841.—*From the Editor.*

FOR THE CABINET.

A specimen of Marble from Granada, of Andalusia.—*From Mr. N. Patrullo.*

A large Map of South America, by Olmedilla. Published by order of the Spanish Government, in 1775.—*From the same.*

The committee, consisting of Professor Bache, Mr. Walker, and Mr. Lukens, to which was referred the paper by Mr. Hassler, entitled "Description of a New Form of Transportable Original Barometer," &c. reported in favour of its publication in the Transactions, and recommended that in accordance with the author's directions, as communicated through the Librarian, it be published without alteration of the phraseology. The Society declined making the publication in the manner proposed, and ordered the paper to be placed at the disposal of Mr. Hassler.

The committee, consisting of Mr. Nicklin, Dr. Hays, and Mr. F. Peale, to which was referred the "Continuation of Mr. Lea's Paper on Fresh Water and Land Shells," read on the 18th of June last, reported in favour of its publication in the Transactions; and it was ordered accordingly.

In this paper Mr. Lea describes twenty-two new species of fresh water and land shells of the United States, chiefly from Alabama and Tennessee. The new *Valvata* (bicarinata) from the Schuylkill is interesting from the fact of its inhabiting within the precincts of our city, and remaining unobserved heretofore. The shell resembles in form the *tricarinata* of Say, but differs in the number of the carinæ,

and in some other characters. The animal differs still more both in form and colour.

Unio Brumleyanus. Testâ ellipticâ, inflatâ, inæquilaterali, posticè subbiangulatâ; valvulis crassis; natibus ———; epidermide nigrâ, politâ; dentibus cardinalibus subgrandibus, lateralibus brevibus subrectisque; margaritâ albâ et iridescente. *Hab.* Warrior River, Tuscaloosa, Alabama.—*Prof. Brumley.*

Unio regularis. Testâ regulariter ellipticâ, subinflatâ, inæquilaterali; valvulis subtenuibus; natibus vix prominentibus; epidermide luteo-fuscâ, radiatâ; dentibus cardinalibus minutis, lateralibus longis curvisque; margaritâ cœruleâ et iridescente. *Hab.* French Broad River, East Tennessee.—*Dr. Troost* and *S. M. Edgar.*

Unio mœstus. Testâ ovatâ, subinflatâ, valde inæquilaterali; valvulis subcrassis; natibus prominulis; epidermide tenebroso-fuscâ, rugoso-striatâ; dentibus cardinalibus parvis, lateralibus longis curvisque; margaritâ atro-purpureâ et iridescente. *Hab.* French Broad River, East Tennessee.—*Dr. Troost* and *S. M. Edgar.*

Unio sparsus. Testâ sparsim tuberculatâ, triangulari, subinflatâ, subæquilaterali, posticè emarginatâ; ad latus planulatâ; valvulis crassis; natibus elevatis; epidermide luteolâ; dentibus cardinalibus grandibus; lateralibus brevissimis rectisque; margaritâ albâ et iridescente. *Hab.* Holston River, East Tennessee.—*Dr. Troost* and *S. M. Edgar.*

Unio argenteus. Testâ obliquâ, oviformi, valdè compressâ, valdè inæquilaterali, posticè subangulatâ; valvulis suberassis; natibus subprominentibus; epidermide luteo-fuscâ, politâ; dentibus cardinalibus subgrandibus, lateralibus longis subcurvisque; margaritâ argenteâ et irideseente. *Hab.* Holston River, East Tenn.—*Dr. Troost* and *S. M. Edgar.*

Helix Mobiliana. Testâ subglobosâ, rufo-corneâ, nitidâ, perforatâ; spirâ brevi, obtusâ; suturis impressis; anfractibus senis, convexis; aperturâ lunatâ; labro reflexo. *Hab.* Vicinity of Mobile, Alab.—*Charles Lea.*

Helix minutissima. Testâ subglobosâ, suprà obtuso-conoideâ, subtus convexâ, fusco-corneâ, minutissimè striatâ, umbilicatâ; spirâ brevi; suturis impressis; anfractibus quaternis, rotundis; aperturâ subrotundâ; labro acuto. *Hab.* Vicinity of Cincinnati.—*T. G. Lea.*

Melania turgida. Testâ lævi, obtuso-conicâ, inflatâ, crassâ, fasciatâ; spirâ brevi, ad apicem acuminatâ; suturis levitcr impressis; anfractibus septenis, planulatis; aperturâ parvâ, formam trapezii habente; columellâ incrassatâ, albâ. *Hab.* Holston River, East Tenn.—*Dr. Troost* and *S. M. Edgar.*

Melania glabra. Testâ lævi, conoideâ, subtenui, nitidâ, tenebroso-castaneâ; spirâ subelevatâ, suturis leviter impressis; anfractibus subplanulatis; aperturâ elongatâ, formam trapezii habente, intus purpuratâ; columellâ incurvâ. *Hab.* Holston River, East Tenn.—*Dr. Troost* and *S. M. Edgar.*

Melania perfusca. Testâ lævi, conoideâ, subcrassâ, tenebroso-fuscâ; spirâ exertâ; suturis lincaribus; anfractibus subplanulatis; aperturâ grandi, inflatâ, ovatâ, intus pallido-purpureâ. *Hab.* Calfkiller Creek, Tenn.—*S. M. Edgar.*

Melania picta. Testâ lævi, obtuso-conicâ, crassâ, sub-fusiformi, subviridi, fasciatâ; spirâ subelevatâ; suturis impressis, superne exaratis; anfractibus octonis, planulatis; aperturâ elongatâ, formam trapezii habente; columellâ incurvâ. *Hab.* Holston River, East Tenn.—*Dr. Troost* and *S. M. Edgar.*

Melania impressa. Testâ transversè et crebissimè sulcatâ, fusiformi, crassâ, rufo-fuscâ; spirâ obtusâ; suturis impressis; anfractibus senis, planulatis; aperturâ ellipticâ sub-grandi, ad basim angulatâ, intus albâ. *Hab.* Coosa River, Alabama.—*Prof. Brumley.*

Melania robusta. Testâ striatâ, fusiformi, crassâ, luteolâ; spirâ obtusâ; suturis subimpressis; anfractibus senis, subconvexis; aperturâ ellipticâ, magnâ, ad basim angulatâ, intus albâ. *Hab.* Coosa River, Alabama.—*Prof. Brumley.*

Melania Jayana. Testâ tuberculatâ, subfusiformi, crassâ, pallido-corneâ; spirâ exertâ; suturis linearibus, curvatis; anfractibus subconvexis, medio impressis, tuberculorum duplici serie cinctis; columellâ incurvatâ, supernè incrassatâ; aperturâ formam trapezii habente, intus albidâ. *Hab.* Cany Fork, De Kalb Co. Tenn.—*Dr. Troost.*

Anculosa rubiginosa. Testâ ovato-gibbosâ, crassâ, lævi, rubiginosâ; spirâ subelevatâ; suturis impressis; anfractibus planulatis; aperturâ enormiter ovatâ, intus albidâ; columellâ crassâ, tenebroso-purpureâ. *Hab.* Warrior River, Alabama.—*Prof. Brumley.*

Anculosa bella. Testâ sub-globosâ, subtenui, supernè tuberculatâ, fasciatâ, virido-fuscâ; spirâ brevi; suturis linearibus, anfractibus ternis, convexis; aperturâ subrotundâ, intus cœruleâ; columellâ maculatâ. *Hab.* Warrior River, Alabama.—*Prof. Brumley.*

Anculosa Griffithiana. Testâ ovato-gibbosâ, crassâ, crebrè et transversè striatâ, fasciatâ; suturis impressis; anfractibus quaternis, planulatis; aperturâ ovatâ, intus fasciatâ; columellâ crassâ, tenebroso-purpureâ. *Hab.* Coosa River, Alabama.—*Prof. Brumley.*

Anculosa tuberculata. Testâ ovatâ, crassâ, supernè tuberculatâ, fuscâ; spirâ brevi; suturis vix impressis; anfractibus subconvexis; aperturâ ovatâ, intus carneâ; columellâ crassâ, maculatâ. *Hab.* Warrior River, Alabama.—*Prof. Brumley.*

Valvata bicarinata. Testâ orbiculari, supernè planulatâ, bicarinatâ, subcrassâ, supernè corneâ, infernè albidâ, latè umbilicatâ; suturis impressis; spirâ depressâ; anfractibus quaternis, convexis; aperturâ rotundâ, intus albidâ. *Hab.* Schuylkill River, west side, below Permanent Bridge.—*H. C. Lea.*

Paludina angulata. Testâ inflatâ, tenui, fuscâ, supernè subvaricosâ, infernè transversè et minutè striatâ, minutè perforatâ; spirâ breviusculâ, ad apicem tenebrosâ; suturis impressis; anfractibus quinis, in medio angulatis; aperturâ magnâ, sub-triangulatâ, intus subrubiginosâ. *Hab.* Coosa River, Alabama.—*Prof. Brumley.*

Paludina Coosaensis. Testâ sub-globosâ, tenui, pallidâ, sub-lævi, perforatâ; spirâ brevi; suturis valdè impressis; anfractibus quinis, rotundis; aperturâ magnâ, subrotundâ, intus albidâ. *Hab.* Coosa River, Alabama.—*Professor Brumley.*

Paludina cyclostomaformis. Testâ subcylindraceâ, subcrassâ, pallido-corneâ, lævi, imperforatâ; spirâ exertâ, ad apicem roseâ, obtusâ; suturis valdè impressis; anfractibus quinis, rotundatis; aperturâ parvâ, subrotundâ, intus salmonis colore tinctâ. *Hab.* Coosa River, Alabama.—*Prof. Brumley.*

Professor Bache communicated some recent observations of the Magnetic Dip, made at Baltimore by M. Nicollet and by

Major Graham of the U. S. Topog. Engineers, and mentioned that they confirmed those made by himself. He added, that they gave additional confirmation to the fact of a very considerable local attraction at the different stations in Baltimore, to which he had been led by comparing his own observations with those of Professors Courtenay and Loomis.*

The observations of M. Nicollet were made with a dipping circle by Robinson, of London, and with two needles. The stations of observation were at the second square, N. E. of the Washington Monument, (the station of observation of Professor Bache,) and in the Botanic Garden of St. Mary's College. The times of observation from 9 A. M. to 12 M., and from 3 to 6½ P. M. on the 28th of April, 1841. The resulting dip at the first station, 71° 34′.9, and at the second, 71° 38′.8.

The observations of Major Graham were made with a dipping circle and two needles, by Gambey. The stations of observation were four in number. No. 1 was N. 5° E. 363 yards from the centre of the Washington Monument, and is supposed to have been the station occupied by Prof. Loomis. The dates of observation, June 9th, 1 to 3 P. M. and June 10th, 6½ to 9½ A. M. The resulting magnetic dips, were 71° 48′.4. and 71° 46′.0, mean 71° 47′.2, agreeing very well with the determination of Prof. Loomis, (71° 50′.3,) after making an allowance for the diminution of dip in the interval between the observations.

Station No. 2 bore N. 45° E. from the centre of the Washington Monument, N. 11° W. from the dome of the Exchange, and was the place where Prof. Bache had observed. The time was June 10th, 1841, 11½ A. M. to 1½ P. M. The resulting dip 71° 31′.9, agreeing very well with the determinations of M. Nicollet and Prof. Bache.

Observations at stations Nos. 3 and 4 were made to ascertain whether a line of iron pipes serving to connect a neighbouring spring-house and dairy, and running nearly E. and W. caused the differences observed in the two stations Nos. 1 and 2. No. 3 was nearly intermediate between Nos. 1 and 2, and 43 feet N. of the line of pipes, bearing of No. 1 for No. 3, N. 35° W. and distance 212 feet. Resulting dip, by two series of observations with one needle, 71° 47′.5. The bearing of No. 3 from No. 4 was N. 8° W. and distance 181 feet, and Nos. 3 and 4 were nearly at the same distances N.

* Proceedings of the Am. Phil. Society, Vol. I. No. 14.

and S. of the line of pipes. The resulting dip, by one needle, at No. 4, was 71° 43′.2, differing 4′.3 from that observed at No. 3. It seems, therefore, by the comparison of stations Nos. 1, 3, and 4, that the presence of this iron will not explain the differences at stations Nos. 1 and 2. Major Graham found the dip, with the same instrument, in the Magnetic Cabinet of the Botanic Garden, St. Mary's College, on the 11th June, between $6\frac{1}{2}$ and $7\frac{1}{2}$ A. M., 71° 38′.8

Professor Bache then communicated the following tabular view of the observations heretofore made at Baltimore, arranged according to the stations and dates.

Station.	Observer.	Date.	Dip.
			° ′
1 Holliday Street, nearly opposite the Theatre,	Prof. Courtenay.	July 19, 1834	70 58.6
2 In the grove, N. of the Washington Monument,	Prof. Loomis.	Sept. 25, 1839	71 50.3
3 N. 5° E. (Magnetic) 363 yards from centre of Washington Monument, supposed the same station as that of Prof. Loomis,	Maj. Graham.	June 10, 1841	71 47.2
4 In the Second Square, N. E. of Washington Monument,	Prof. Bache.	Aug. 27, 1840	71 34.4
5 ,, ,, ,,	Mr. Nicollet.	Apr. 28, 1841	71 34.9
6 ,, ,, ,,	Maj. Graham.	June 10, 1841	71 31.9
7 At two points between 3, and 4, 5, 6,	,, ,,	,, ,,	71 45.3
8 In the Botanic Garden, St. Mary's College,	Mr. Nicollet.	Apr. 28, ,,	71 38.6
9 ,, ,, ,,	Maj. Graham.	June 11, ,,	71 38.8

The results obtained by different observers and with different instruments are, Professor Bache remarked, remarkably accordant, and leave no doubt of the care with which the observations were made, or of the value of the instruments.

Mr. Lea mentioned to the Society, that Mr. Lyell is about to visit this country, upon the invitation of the Lowell Institute, to give lectures before that body. He announced also that M. Ramon de la Sagra is about to publish a Journal of Natural History at Havana, and that he invited communications for the work.

Mr. Kane submitted the following resolutions, which were adopted:

Resolved, That a committee be appointed to negotiate with

the City or County of Philadelphia, as they shall judge expedient, for the sale of the Hall of the Society and the lot of ground on which it stands.

Resolved, That the same committee be instructed to inquire into the practicability and expediency of purchasing for the use of the Society the building now occupied by the Philadelphia and Chinese Museums.

The Committee consists of Dr. Patterson, Dr. Chapman, and Mr. Richards.

Mr. Kane, Reporter, laid on the table No. 18 of the Proceedings of the Society, for May and June, 1841.

The decease of the following named members was announced:

Joseph Parker Norris, 22d June, 1841; aged 78:

James Abercrombie, D.D. 26th June, 1841; aged 83:

William James Mac Neven, M.D. 12th July, 1841; aged 78:

Julien Ursin Niemcewicz, 1841; aged 84.

George Bancroft, of Boston, was duly elected a member of the Society.

Special Meeting, July 28.

Present, twenty-three members.

Mr. Du Ponceau, President, in the Chair.

On motion of Dr. Patterson, from the Committee appointed at the last meeting to negotiate for the sale of the Hall of the Society, &c., that Committee was authorized to take final order in the matters referred to it.

Special Meeting, August 9.

Present, twenty-one members.

Mr. Du Ponceau, President, in the Chair.

Dr. Patterson, from the Committee appointed on the 16th July, reported in part, that the Committee had purchased the building now occupied by the Philadelphia and Chinese Mu-

seums, for the sum of thirty-seven thousand two hundred and fifty dollars, subject to certain incumbrances; and upon his motion it was unanimously *Resolved*, that the Society ratifies the purchase made in its name by the Committee, and that the Committee be authorized to take all necessary measures for carrying it into effect. Other resolutions were also adopted on motion of Dr. Patterson, making provision for paying the purchase money, and constituting a Committee to make arrangements for the accommodation of the Society in the new building, &c. This Committee consists of Dr. Patterson, Dr. Bache, Mr. Kane, Mr. Richards, and Dr. Hays.

Stated Meeting, August 20.

Present, twenty-two members.

Mr. Du Ponceau, President, in the Chair.

Letters were received and read—

From Major Edward Sabine, dated Woolwich, May 19, 1841, and from George Bancroft, Esq., dated Boston, July 10, 1841, making acknowledgments for the honour of their election to membership:—

From the Cambridge Philosophical Society, dated May 24, 1841; the Royal Asiatic Society, dated November 7, 1840; and the Geological Society of London, dated May 20, 1841, acknowledging the receipt of copies of the Society's Transactions and Proceedings:—

From the Rev. Dr. Samuel Miller, of Princeton, dated July 5, 1841, and Mr. Moncure Robinson, dated May 23, 1841, accompanying donations to the Society's Library:—

From His Excellency the Chevalier Pierre de Götz, Counsellor of State, &c. &c., dated St. Petersburg, $\frac{10}{24}$ June, 1839, accompanying donations to the Library from the Imperial Academy of Sciences, from the Minister of Public Instruction of Russia, from Admiral Schiskow, and from himself, and requesting the Society to distribute, on behalf of the Imperial Academy, four copies of a work, entitled "Untur-

suchungen über die Sprache," &c., in 3 vols., published under its auspices.

This letter gives an interesting account of the extent to which the system of public instruction obtains in Russia. Referring to the work, entitled "Enumeration of Schools," &c., which was transmitted with it, the writer says:—

It gives me pleasure to offer you this work as an official document, containing statistical details that are sufficiently curious, and the result of which may appear to you surprising.

Foreign statisticians, reckoning only those establishments which are under the direction of the Ministry of Public Instruction, had estimated the number of scholars in Russia, compared to that of the population, as 1 to 700. It is evident that this estimate must be fundamentally wrong, since no place in the calculation is given to the schools, and other establishments, under different control from that of the Ministry of Public Instruction. Government having caused an inquiry to be instituted on this subject, the result was, that, not counting the Kingdom of Poland and the Grand Duchy of Finland, the number of scholars in 1834, compared with that of the inhabitants, was as 1 to 210. But in this calculation were still not comprised the schools founded at the churches and convents of the Græco-Russian confession, the peasant schools in the Baltic Governments, the youth who enjoy domestic education, the individuals to whom the priesthood teaches writing and the catechism, besides 3668 Jewish and 398 Mahometan schools. When in addition to this it is considered, that since the year 1834 many new schools, especially primary schools, have been established, and that the number of scholars in the inferior classes of all the schools has so increased that it has become necessary to divide the classes into sections, we may with sufficient certainty estimate that there is now in Russia a scholar for 45 individuals, at Moscow 1 for 35, and at St. Petersburgh 1 for every 19.

Letters were also received and read—

From Mr. Du Ponceau, dated August 20, 1841, communicating the letter of M. de Götz:—

From Mr. D. B. Warden, dated Paris, June 18, 1841, in relation to the history of certain gentlemen, formerly members of this Society:—

From Dr. William B. Stevens, of Savannah, to Dr. Dungli-

son, Secretary of the Historical and Literary Committee, dated August 20, 1841, in relation to the materials which he has collected for his History of the State of Georgia, and inviting aid in making further collections.

The belief, he says, that there may be in the keeping of the Philosophical or Historical Societies of Pennsylvania, some papers or documents, some written or published records, pertaining to this period, has induced our Board to apply for the use of whatever are to be found.

There have been many interesting ties subsisting between Pennsylvania and Georgia. In the founders of their respective colonies, there was a harmony of plan which proved the accordance of their natures, and in their treatment of the aborigines, the humanity and moderation of each made him eminently conspicuous. Penn and Oglethorpe were the noblest examples of lenity towards the Indians in the history of the settlement of British America. The character of the early settlers of the two colonies is analogous in many respects, and closely interwoven. There emigrated to both of them large masses of Germans, Saltzburgers and Moravians, coming from one Fatherland, holding one creed, and bound together by identical domestic habits: they separated in consequence of poverty, in America, but still bore the lengthened and not ruptured chain of friendship along with them. The town of Bethlehem, in Pennsylvania, was settled by Moravians from this colony in 1741, under the guidance of their good Bishop Nitchman. In the labours of Whitfield we find another bond of interest, and the large contributions to his Georgia Orphan House, which he obtained in your state, evinced the reality of its interest in the rising colony of the south. Franklin, the immortal Franklin! was another link to bind us together. For a series of years he was the agent of this province, acting as her solicitor in England, and his letters to friends in Georgia, could they all be recovered, would constitute a most desirable possession for our citizens. (Three of them, together with his account against the state of Georgia for services rendered her in London, all in his own hand writing, were fortunately found a few days since, among some old papers in the loft of a counting-room, but the greater part of his correspondence is irrecoverably gone.) These, with other facts, which might be mentioned, are ties which bind us together over and above the common sympathies which we entertain as members of the same great nation.

The following donations were announced:—

FOR THE LIBRARY.

U. S. Congressional Documents, 1st Sess. 26th Congress. 21 Vols. 8vo.—*From the Secretary of State.*

Ancient Laws and Institutes of England. 1840. Fol.—*From the Commissioners on the Public Records of the Kingdom.*

Report on the Invertebrate Animals of Massachusetts. Cambridge, 1841. 8vo.—*From the Legislature of Massachusetts.*

Ancient Geography of the Russian Empire. 2d Ed. St. Petersburg, 1838. 8vo.—*From the Imperial Academy of Sciences of St. Petersburg.*

Russian Grammar. By Alexander Wostokoff. St. Petersburgh, 1839. 8vo.—*From the same.*

Abridged History and Geography of Servia. By Demetrius Momirovitch. St. Petersburgh, 1839. 8vo.—*From the same.*

Commentationes Societatis Regiæ Scientiarium Göttingensis Recentiores. Vol. VI. Göttingen, 1828. 4to.—*From the Society.*

Transactions of the Royal Society of Edinburgh. Vol. XIV. Part 2. 1840. 4to.—*From the Society.*

Journal of the Royal Geographical Society of London. Vol. X. Part 3. 1841. 8vo.—*From the Society.*

Journal of the Asiatic Society of Bengal, N. S. Nos. 19, 20, 21. Calcutta, 1840. 8vo.—*From the Society.*

Boston Journal of Natural History. Vol. III. No. 4. 1841. 8vo. *From the Boston Society of Natural History.*

Journal of the Franklin Institute. Aug. 1841. 8vo.—*From the Institute.*

Constitution of the National Institution for the Promotion of Science, as amended. Washington. April, 1841.—*From the Institution.*

Records of the Presbyterian Church in the United States of America. Philadelphia, 1841. 8vo.—*From the Presbyterian Board of Publication.*

Minutes of the General Assembly of the Presbyterian Church in the U. S. A. 1841. 8vo.—*From the same.*

Tracts.—Tentamen Medico-Botanicum de Plantis Cichoraceis. Primæ Lineæ Technologiæ Generalis. Radix Plantarum mycetoidearum. De Fructificatione Generis Rhizomorphæ. De Linguæ Latinæ usu, a medicis temerè neglecto. Commentatio super Ve-

ronicis Spicatis Linnæi. De Respiratione Sepiæ Officinalis. Esquisse du Système d'Anatomie, &c. Par Oken.—*From Prince Maximilian de Wied Neuwid.*

Institut Royal de France: Séance Publique Annuelle des cinq Académies. 3 Mai, 1841. 4to.—*From Mr. D. B. Warden.*

Institut Royal de France: Séance Publique Annuelle de l'Académie des Sciences, Morales et Politiques. 15th May, 1841. 4to.—*From the same.*

Société Royale et Centrale d'Agriculture:—Compte-rendu des travaux de la Société, Séance Publique, 18 Avr. 1841. Bulletin des Séances, Compte-rendu Mensuel, 6th Jan. 1841. Notice Biographique sur M. Huerne de Pommeuse. Rapport sur les travaux de MM. Gossin. Notice Biographique sur M. Jean-Pierre Labbé. Mémoire par M. le Baron de Rivière, sur les Poissons, &c. Rapports sur divers concours, &c. &c.—*From Mr. D. B. Warden.*

Tracts.—Traité de Commerce entre la France et la Hollande. Lettre de M. Joseph Clerc. Observations des Délégués du Commerce Maritime, &c.—*From the same.*

Divers Traités, par M. Jomard.—*From the Author.*

Etwas über die Natur-Wunder in Nord America, zusammengetragen von Charles Cramer, &c. &c. &c. St. Petersburg, 1840. 8vo. *From the Author.*

Ta Tsing Leu Lee; being the fundamental laws, &c. &c. of China, translated by Sir George Thomas Staunton, Bart. F. R. S. London, 1810. 4to.—*From Mr. Benjamin F. French.*

Chinese Magazine. By Gutzlaff and others. 2 Vols. 8vo.—*From the Rev. C. Gutzlaff.*

Brief Account of Jesus Christ, &c. in Chinese. By C. Gutzlaff. 8vo.—*From the same.*

Portfolio Chinensis, or a Collection of Authentic Chinese State Papers, illustrative of the History of the Present Position of Affairs in China. By J. Lewis Shuck. Macao, 1840. 8vo.—*From Dr. Diver.*

History of the United States, in Chinese, by Bridgman. History of the Jews, in Chinese, by Gutzlaff. Chinese Missionary Tracts, by Gutzlaff. Macao. 4 Vols. 8vo.—*From the same.*

Malay Idiomatic Phrases.—*From the same.*

A Brief Grammatical Analysis of the Grebo Language. Dictionary of the Grebo Language. Matthew's Gospel in the Grebo Language. Baibli ah Histori, in Grebo. The Life of Christ. The

Grebo Hymn Book. 1840. 6 Vols.—*From Lieut. Godon, U. S. Navy.*

De la Littérature et des hommes de lettres des Etats Unis d'Amérique, par Eugène A. Vail, &c. &c. Paris, 1841. 8vo.—*From the Author.*

A Description of the English Province of Carolana, by the Spaniards called Florida, and by the French La Louisiane, &c. By Daniel Coxe, Esq. London, 1722. (Reprint. St. Louis, 1840.) 8vo. *From M. Lewis Clarke, of St. Louis.*

Memoir of the Geological Survey of the State of Delaware, &c. By James C. Booth, &c. &c. Dover, 1841. 8vo.—*From the Author.*

Letter to S. J. Peters, Esq. on the Improvement of the Navigation of the Mississippi. By Albert Stein. 1841. 8vo.—*From Mr. William K. Robertson.*

Letter to the Hon. Henry Clay, President of the American Colonization Society, &c. &c. By R. R. Gurley. London, 1841. 8vo.—*From Mr. Petty Vaughan.*

An Exposition of some of the Doctrines of the Latin Grammar. By Gessner Harrison, M.D., Professor, &c. Part 1. Charlottesville, 1839.—*From the Author.*

Supplementary Report on Meteorology. By James D. Forbes, Esq., F.R.S., &c. &c. London, 1841. 8vo.—*From the Author.*

Memoir of the Rev. Charles Nisbet, D.D., late President of Dickinson College. By Samuel Miller, D.D., Professor, &c. &c. New York, 1840. 12mo.—*From the Author.*

Memoir of the Rev. John Rodgers, D.D., late Pastor, &c. &c., New York. By Samuel Miller, D.D., Professor, &c. &c. Philadelphia, 1840. 16mo.—*From the Author.*

Remarks on the Present State of the Evidence in regard to the Larvæ of the Hessian Fly. By B. H. Coates, M.D. August, 1841. 16mo.—*From the Author.*

A Practical Description of Herron's Patent Trellis Railway Structure, &c. &c. By James Herron, Civil Engineer. Philadelphia, 1841. 4to.—*From the Author.*

A Description of Ithiel Town's Improvement in the Principle, &c. of Bridges, Roads, &c. By Ithiel Town. New York, 1839. 4to.—*From the Author.*

Description of an entire Head and various other Bones of the Mastodon, recently presented to the Society by some of its Members. By W. E. Horner, M.D. and I. Hays, M.D. 1841. 4to.—*From the Authors.*

On the Evaporative Power of Different Kinds of Coal. Edinburgh, 1841. 8vo.—*From Major Bache, U. S. Engineers.*

Geography of Great Britain and Ireland, in Chinese.—*From Dr. Diver.*

FOR THE CABINET.

A Lithographic Portrait of Mr. Hassler, Superintendent of the U. S. Coast Survey.—*From Mr. Vaughan.*

The copies of the work of Admiral Schischkow, transmitted for distribution by the Imperial Academy of St. Petersburg, were ordered to be sent to the University of Harvard, Mass.; the University of Virginia; the Philadelphia Library; and the National Institution at Washington.

Stated Meeting, September 17.

Present, twenty-two members.

Dr. CHAPMAN, Vice-President, in the Chair.

Letters were received and read—

From the Rev. Charles Gutzlaff, dated Macao, March 16, 1840, making acknowledgments for the honour of his election to membership, and giving information as to his progress in the preparation of the Chinese Dictionary and Grammar:—

From the Royal Academy of Sciences, Institute of France, dated July 5, 1841; the Royal Society of Edinburgh, dated December 7, 1840; the Royal Asiatic Society, without date; the Royal Academy of Sciences of Göttingen, dated April 2, 1841; and the Royal Academy of Sciences of Berlin, dated July 15, and August 10, 1840; transmitting donations to the Library, and acknowledging the receipt of the Transactions and Proceedings of the Society:—

From the Hon. C. C. Cambreleng, Minister to Russia, dated St. Petersburg, June 19, 1841, transmitting, at the request of Admiral Krusenstern, a copy of his Charts of the Pacific Ocean:—

From the Rev. William M. Engles, dated July 17, 1841, transmitting, on behalf of the General Assembly of the Presbyterian Church in the United States of America, a copy of their Minutes for 1841; and on behalf of the Presbyterian Board of Publication, a volume of the early records of the Presbyterian Church in this country:—

From Mr. F. A. Hassler, withdrawing his paper on a transportable barometer, recently presented to the Society.

The following donations were announced:—

TO THE LIBRARY.

Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin; 3*d and* 4*th Vols. for* 1832, *and* 1*st Vol. for* 1838. Berlin, 1839. 4to.—*From the Royal Academy of Berlin.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie, &c., *for* 1839, *July to Dec., and for* 1840: *and* Preisfragen der Königl. Preuss. Akademie zur Jubelfeier des Regierungs-Antritts Königs Friedrichs II. auf das Jahr 1844.—*From the same.*

Annaler for Nordisk Oldkyndighed, udgivne af det Kongelige Nordiske Oldskriftselskab, 1839.—*From the Royal Society of Northern Antiquaries.*

Mémoires de la Société Royale des Antiquaires du Nord, 1838, 1839.—*From the same.*

Transactions of the Royal Society of Edinburgh. Vol. XV. Part 1. Edinburgh, 1841. 4to.—*From the Society.*

Transactions of the Zoological Society of London. Vol. II. Part 5. London, 1841. 4to.—*From the Society.*

Transactions of the Geological Society of London. Vol. VI. Part 1. London, 1841. 4to.—*From the Society.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais, de Valencia. Nos. 13, 14, 15, 16, 17, 19. Valencia, Jan. to July, 1841. 8vo.—*From the Society.*

Proceedings of the Royal Society of London. Nos. 46, 47. London, 1840, 1841. 8vo.—*From the Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. No. 3. June, 1841. 8vo.—*From the Academy.*

Pennsylvania State Documents.—Journal of the Senate of Pennsylvania, Session 1841, 3 Vols. Journal of the House of Representatives of Pennsylvania, Session 1841, 3 Vols. Reports of the

State Treasurer, 1st November 1839 and 1840, 2 Vols.—*From the Commonwealth of Pennsylvania.*

Supplemens au Recueil de Mémoires Hydrographiques, pour servir d'analyse à l'Atlas de l'Ocean Pacifique, par le Vice-Amiral de Krusenstern. St. Petersburg, 1833. 4to.—*From the Author.*

Atlas de l'Ocean Pacifique, dressé par M. de Krusenstern, Contre-Amiral, &c. &c. St. Petersburg, 1827. Folio.—*From the Author.*

O Auxiliador da Industria Nacional. Vol. IV. Nos. 1, 2, 3, 4, 5. Vol. IX. Nos. 1, 2. Rio Janeiro, 1836, 1841. 8vo.—*From Mr. J. S. de Rebello.*

Prodromus Systematis Herpetologiæ Caroli Luciani Bonaparte, Muxiniani Principis. 8vo. 1840.—*From the Author.*

Illustrations of the Affinity of the Latin Language to the Gaelic or Celtic of Scotland. By T. Stratton, &c. &c. Kingston, U. C. 1840. 4to.—*From the Author.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. II. No. 3. Sept. 1841.—*From the Institute.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D., &c. &c. New Series. Vol. I. No. 2.—*From the Editor.*

Reports in reference to the Construction of the Potomac Aqueduct, and to the Kyanizing of Timber, from the Colonel of the Topographical Engineers, U. S. Washington, 1841. 8vo.—*From Col. J. J. Abert, U. S. Top. Eng.*

The History of North Carolina from the Earliest Period. By François-Xavier Martin. New Orleans, 1829. 2 Vols. 8vo.—*From Mr. B. F. French.*

Address delivered at Jefferson College, Louisiana. By Alexander H. Everett, President, &c. New Orleans, 1841. 8vo.—*From the Author.*

Account of some Parhelia observed at Milford and Camden, Delaware, 14th March. 1841. By A. D. Chaloner, M.D., &c. &c.—*From the Author.*

Official Register of the United States' Military Academy. 1841.—*From Lieut. Col. Delafield.*

What to Observe. By J. R. Jackson. London, 1841. 8vo.—*From the Author.*

The World in a Pocket Book, &c. By W. H. Crump. Philadelphia, 1841. 12mo.—*From the Author.*

Pantology, or a Systematic Survey of Human Knowledge, &c. &c. By Roswell Park, Professor, &c. Philadelphia, 1841. 8vo.—*From the Author.*

Supplement to a Paper on the Mutual Action of Permanent Magnets, &c. By the Rev. Humphrey Lloyd, D.D. Dublin, 1841. 4to.—*From the Author.*

Contributions to Terrestrial Magnetism. No. 2. By Lieut. Col. Edward Sabine, R. A., &c. &c.—*From the Author.*

Report on the Bear Valley Coal District, in Dauphin County, Pennsylvania. By Walter R. Johnson, A.M., &c. &c.—*From the Author.*

Filices Britannicæ, a History of British Ferns. Part 2. By James Bolton, &c. &c. London, 1790. 4to.—*From Mr. John Penington.*

Metaphysische Anfangsgrunde der Naturwissenschaft von Immanuel Kant. Riga, 1786. 8vo.—*From Mr. Du Ponceau.*

Grundlegung zur Metaphysik der Sitten von Immanuel Kant. Riga, 1792. 8vo.—*From the same.*

Psychische Anthropologie, von Gottlob Ernst Schulze, &c. &c. Göttingen, 1826. 8vo.—*From the same.*

Du Droit de la Paix et de la Guerre, &c. &c. Paris, 1793. 8vo.—*From the same.*

The Lyric Works of Horace, translated, &c. Philadelphia, 1786. 8vo.—*From the same.*

Statuts de l'Académie des Inscriptions, &c. Stockholm, 1788. 8vo.—*From the same.*

An Arrangement of British Plants according to the Latest Improvements of the Linnean System. Sixth Edition. London, 1818. 4 Vols. 8vo.—*From Mr. Vaughan.*

Principles of Legislation from the MS. of Jeremy Bentham. By M. Dumont, &c. &c. Boston, 1830. 8vo.—*From the same.*

Handbuch der Deutschen Literatur, &c. Von Johann Samuel Ersch, &c. Amsterdam, 1812, 1814, 1815. 3 Vols.—*From the same.*

Memoranda of a Residence at the Court of London. By Richard Rush, &c. &c. Philadelphia, 1833. 8vo.—*From the same.*

Dr. Bache announced the decease of Mr. Joshua Gilpin, a member of the Society, who died on the 22d of August last, at his residence, near Wilmington, Delaware, aged 75.

Dr. B. H. Coates made an oral communication in relation to the Hessian Fly.

Dr. Coates stated that the result of a number of examinations, made in the vicinity of Philadelphia by several observers, on the crops of the present year, has proved the pale yellow larva in the hollow of the straw of wheat, to be the same with that which is ultimately converted into the Cecidomyia Destructor of Say, and the Hessian Fly of our cultivators. In many instances, referrible perhaps to a peculiarity in the present season, the animal went through all its stages before escaping from the cavity; thus affording irrefragable evidence of the identity of the species.

In no case known to Dr. C. had any thing resembling a caterpillar or maggot, or any thing apparently capable of locomotion, been found under the sheath of the leaf: the body observed, was always immovable, and fixed in a depression of the straw.

Nor was any insect known to have been found which approached to the genus Lasioptera, as given by Meigen; all those examined in the perfect state, which were not the Ceraphron, since referred to Pteromalus and Eurytoma, in either its four-winged or its apterous form, being tipulide animals, and betraying no important difference from those observed by Mr. Say.

Dr. C. called attention to several notices of this subject in the Proceedings of the Academy of Natural Sciences.

Professor Henry, of Princeton, exhibited to the Society a simple form of the Heliostat, or instrument for throwing a stationary beam of light into a darkened room.

He stated that this article of apparatus, which is indispensable in delicate experiments on light, is in its usual form a very complex instrument, and consequently very expensive; while the one to which the attention of the Society was directed, is very simple, and scarcely cost more than the tenth part of the price of one of the old form.

It was made in accordance with the plan given by Dr. Thomas Young in the first volume of his Lectures on Natural Philosophy, which consists in reflecting a beam of light into the room in a line parallel to the axis of the earth, and then causing it to retain this direction by giving the reflector a rotatory motion equal to the apparent motion of the sun. The instrument consists of a flat block of mahogany, about nine inches long and five inches wide, on which is placed, in an inclined position, the wheel work of a common pocket watch. This serves to give rotatory motion to a brass wheel of about

five inches in diameter, which is so geared into the large wheel of the watch as to make one turn in twenty-four hours. The axis of this wheel is a steel rod, carrying on its upper end a small mirror, which can be set in any position by means of an universal joint. The watch work and the wheel are attached to the mahogany block by a hinge, so that the axis of the wheel can be inclined to the horizon at an angle precisely equal to the latitude of the place where the instrument is to be used.

The adjustment of the instrument is very simple. It is placed on the outside of the window, with the axis of the wheel parallel to the axis of the earth; a meridian line having been traced on the window sill for this purpose. The mirror is then set so that the beam of light is thrown into the room in a line forming the prolongation of the axis of the wheel, which is readily effected by means of a mark previously made on the opposite wall. The beam will preserve this direction during the day, since the mirror and the sun revolve with the same velocity, and are therefore comparatively at rest. The only motion of the beam in reference to terrestrial objects is one of rotation on its own axis. If the required direction of the beam is different from that of the first reflection, a second mirror is used.

Professor Henry's object in exhibiting this article to the Society, was to render this simple contrivance more generally known in our country. He stated that the invention probably belongs to Dr. Young; that it was at least published by him in 1807, although an account of the same instrument is given in the London and Philosophical Magazine for 1833, as a new invention by Mr. Potter. The details of the instrument exhibited, differ from those proposed by Mr. Potter, in the addition of a hinge and clamp-screw, by which the axis may be adjusted to the angle of the latitude. The instrument was constructed by an ingenious watchmaker at Princeton; and its whole cost, including the watch work, was but sixteen dollars.

Dr. Patterson and Mr. Walker read strictures by Mr. Hassler upon a notice of the Massachusetts State Survey which appeared in the Proceedings for June last, and commented on the apparent misconceptions of Mr. Hassler, as did several other gentlemen.

Professor Bache communicated, on behalf of Professor Rümker, of Hamburg, the observations made in 1838, at the observatory in that city, on Encke's comet, with their reductions.

Dr. Patterson, from the Committee appointed in relation to the buildings of the Society, made a further report of progress; and on his motion, additional powers were conferred on the Committee.

Stated Meeting, October 1.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were received and read—

From the Royal Geographical Society of London, dated May 12, and July 12, 1841,—the Zoological Society of London, dated August 20, and November 7, 1840, and January 13, May 19, and July 9, 1841,—the Horticultural Society of London, dated July 20, 1841,—and the Linnean Society of London, dated August 12, 1841; announcing the transmission of donations to the Library, and acknowledging the receipt of the Transactions and Proceedings of the Society:—

From Dr. H. J. Bowditch, of Boston, dated Sept. 14, 1841, accompanying a Report of the Bowditch Library, and acknowledging the receipt of the Transactions and Proceedings:—

From Col. J. R. Jackson, dated London, July 19, 1841, transmitting through Mr. Du Ponceau to the Society his work, entitled, "What to Observe:"—

From Mr. Joseph E. Bloomfield, dated New York, September 26, 1841, relative to a deposit made by him with the Society, of two silver goblets and a cestus, taken by one of Pizarro's soldiers from the Temple of the Sun, in Peru:—

From the Chief Engineer U. S. A., Col. Totten, dated Washington, September 17, 1841, accompanying a donation to the Library; and from Mr. John B. Murray, dated Liverpool, August 28, 1841, offering to the Society, on certain conditions, a printing press at which Dr. Franklin worked when in England. This letter was referred to a committee.

The following donations were announced:—

FOR THE LIBRARY.

Journal of the Royal Asiatic Society of Great Britain and Ireland. Vol. VI. No. 12. London, 1841. 8vo.—*From the Society.*

Proceedings of the Committee of Commerce, &c. of the Royal Asiatic Society, 1841. London. 8vo.—*From the same.*

Transactions of the Linnean Society. Vol. XVIII. Part 4. London, 1841. 4to.—*From the Society.*

Memoirs of the American Academy:—An Account of the Magnetic Observations made at the Observatory of Harvard University, Cambridge. By Joseph Lovering, Hollis Professor, &c. and W. Cranch Bond, &c. &c. 4to.—*From the Academy.*

Annales des Mines. 3me Sér. Tome XVIII. 4me, 5me, and 6me Livrns. Paris, 1840. 8vo.—*From the Ingenieurs des Mines.*

Journal Asiatique. 3me Sér. Tome XI. Nos. 61, 62, 63. Paris, 1841. 8vo.—*From the Asiatic Society, Paris.*

Bulletin de la Société de Géographie. Juillet, 1840. 8vo.—*From the Society.*

Nouveaux Tableaux de Lecture, assujettés au systéme de l'enseignement mutuel. Paris, 1835. Fol.—*From Mr. Du Ponceau.*

Annual Reports of the Royal Cornwall Polytechnic Society, 1839 and 1840. Falmouth. 8vo.—*From Mr. Robert Were Fox.*

Report on some Observations on Subterranean Temperature. By Robert Were Fox. London, 1841. 8vo.—*From the same.*

Descriptiones et Icones Amphibiorum, auctor Dr. Joannes Wagler. Fasciculi 1, 2, 3. Fol.—*From Dr. Holbrook.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie; Uitgegeven door J. Van der Hoeven, M.D., &c. en W. H. de Vriese, M.D., &c. Vol. VIII. No. 3. Leyden, 1841. 8vo.—*From the Editors.*

Papers on Practical Engineering. Published by the Engineer Department of the U. S. Army. Washington, 1841. 8vo.—*From Col. J. G. Totten.*

Essai sur la Philosophie des Sciences, &c., par André-Marie Ampére, &c. &c. Paris, 1834. 8vo.—*From Professor Henry.*

Informe presentado a la Real Junta de Fomento de Agricultura, &c. de Cuba, en el Expediente sobre la Escuela Nautica, &c. Havanna, 1834. Fol.—*From Señor de la Susa.*

Impugnacion al Examen de Cousin sobre el ensayo del Entendimiento

Humano de Locke. Entregas I. II. Havanna, 1840. 8vo.—*From the same.*

Remarks on the Abracadabra of the Nineteenth Century, or on Dr. Samuel Hahnemann's Homœopathic Medicine, &c. By William Leo-Wolf, M.D. New York, 1835. 8vo.—*From some of the Physicians of Philadelphia.*

The Case of the Seneca Indians, in the State of New York, illustrated by Facts. Philadelphia, 1840. 8vo.—*From Mr. G. M. Justice.*

A Further Illustration of the Case of the Seneca Indians in the State of New York, &c. &c. Philadelphia, 1841. 8vo.—*From the same.*

Report of the Proprietors of the Bowditch Library. Boston, 1841.—*From the Proprietors.*

Notice of a Model of the Western Portion of the Schuylkill or Southern Coal Field of Pennsylvania. By Richard C. Taylor, &c. &c.—*From the Author.*

Address before the Phi Beta Kappa Society of Union College, 27th July, 1841. By William Kent.—*From Mr. Du Ponceau.*

Printer's Pension Society: List of Subscribers, Rules and Regulations, 13th and 14th Annual Reports, &c. &c. London, 1840, 1841.—*From the Society.*

History of the United States, in Chinese. By Bridgman.—*From Rev. Joseph S. Travelli.*

Tracts in the Malay Language: Natural History, &c. &c.; and a Tract in the Bugis Language of Macassar.—*From the same.*

Donations were made to the Cabinet, in the name of the late Joshua Gilpin, Esq., of a specimen of rock from the highest pinnacle of Mont Blanc, which had been presented to him by Professor de Saussure in 1798; and of the tusk of a swordfish which was darted into an American ship in the Chinese Sea, and there broken off.

Dr. Patterson presented a continuation of Mr. Borden's paper on the Survey of Massachusetts, which was referred to a Committee.

Professor Bache called the attention of the Society to the "Account of the Magnetic Observations made at the Observatory of Harvard University, Cambridge," by Prof. Lovering and Mr. Bond, printed in the Memoirs of the American Academy at Boston, and presented this evening to the Society.

This paper contains an account of the observatory, and of the transit and magnetic declination instruments with which it was provided, of the mode and times of observing, with deductions from the observations, and tables of the observations themselves. Among other interesting matter, is the investigation of an empirical formula, expressing the daily changes of magnetic declination in terms of the solar time, by Prof. Peirce, and a comparison of the magnetic declination and dip deduced from Gauss' formula, with those elements as obtained by observation. Besides the monthly term-days, several extra days in each month had been devoted to observations at short periods. The bi-hourly observations had not been attempted. The paper closes with an account of the new observatory, and of the complete set of magnetic instruments with which it is furnished.

Dr. Hays invited the attention of the Society to a very extensive and highly interesting collection of fossil bones, chiefly of the Mastodon, recently brought to this city by Mr. Albert Koch, of St. Louis.

Dr. H. stated that this collection comprises portions of twenty-three lower and eleven upper jaws, of upwards of two hundred teeth, and a sufficient number of the other bones to form a nearly complete skeleton.

Four of the lower jaws appertain to the genus Tetracaulodon. One of these is remarkable from having a single alveolus for a tusk. This alveolus is on the right side; and in its form, position, and size, is similar to that of a specimen in the collection of the Society, described and figured in the Transactions, Vol. IV. Pl. XXIX. There is not the slightest trace of a corresponding alveolus ever having existed on the other side. Two other jaws have also only a single alveolus; but the specimens are too imperfect to determine whether or not they had another, though Dr. H. infers that they had, and that the existence of a single tusk in the lower jaw was a merely accidental occurrence. The specimen described by Dr. Godman has two, and also that belonging to the Museum of the University of Virginia. See Vol. IV. of the Transactions, Plates XXVI. and XXVII.

The fragment of a fourth jaw is particularly interesting, from its apparently belonging to a distinct variety, if not even a new species, of Tetracaulodon. This consists of the chin, and a portion of the left side. In the chin there is a small alveolus on each side. This jaw is strikingly similar to one in the Cabinet of the Society, and described

by Dr. H. as belonging to the young of the M. *giganteum*. See Transactions, Vol. IV., N. S., Pl. XX. In the latter specimen the alveolus was so small and imperfect, and so different from that in the species of Tetracaulodon then known, that Dr. H. considered it an accidental formation. In the specimen in Mr. Koch's collection the alveolus is sufficiently perfect, the lining plate of bone in part remaining, to place beyond all doubt its being a socket for a tusk.

Two of the fragments of upper jaws are extremely interesting, from possessing, one an entire tusk, and the other the inner portion of both tusks, apparently in their original position; thus solving the problem as to the position of the tusks in this genus, and showing it to be the same as in the elephant.

The collection of bones forming the skeleton, called by Mr. Koch the Missourium, though very unnaturally put together, is an object of interest, from the large size and fine state of preservation of some of the bones, particularly the femur and the atlas. The head is far less perfect than the one belonging to the Society. The whole vault of the cranium, except the inner table, is wanting. The two tables of the cranium being widely separated in this genus, the absence of the outer table and the diploe gives to the head a remarkably flat appearance. This, with the *smoothness* of a great part of the upper surface, resulting from the natural structure of the cells of the diploe, which are very large, led Mr. Koch to believe that the cranium was entire, and that it belonged to an animal different from the Mastodon.

Professor Bache presented some further astronomical observations from Mr. Rümker, of Hamburg.

These observations are published in the Astronomische Nachrichten, No. 432, which has been received in this country since the meeting of the Society.

Stated Meeting, October 15.

Present, thirty-seven members.

Judge Hopkinson, Vice President, in the Chair.

Letters were received and read—

From the Royal Society of Sciences of Copenhagen, dated

May 1, 1841, acknowledging the receipt of the Transactions and Proceedings of the Society:—

From the President of Harvard University, dated Cambridge, Sept. 7, 1841, thanking the Society for the work of Admiral Schisckow, presented by it in the name of the Imperial Academy of St. Petersburg to the University Library.

The following donations were announced:—

TO THE LIBRARY.

Det Kongelige Danske Videnskabernes Selskabs Naturvidenskabelige og Mathematiske Afhandlinger. Ottende Deel. Copenhagen, 1841. 4to.—*From the Royal Society of Denmark.*

Oversigt over det Kongelige Danske Videnskabernes Selskabs Forhandlinger og dets Medlemmers Arbeider, i. a. 1839, 1840. 4to.—*From the same.*

Censura Commentationum Societati Regiæ Danicæ Scientiarum a. 1840 oblatarum, et Novæ Questiones quas in a. 1842 Societas cum præmii promisso proponit.—*From the same.*

Proceedings of the Meteorological Society of London, during the Sessions 1838–39 and 1839–40.—*From the Society.*

Royal Astronomical Society of London. Proceedings. Vol. V. No. 16. June, 1841.—*From the Society.*

Proceedings of the Geological Society of London. Vol. III. Part II. No. 76. 1841.—*From the Society.*

Botanical Society of London. Regulations, &c. 1841.—*From the Society.*

Royal Geographical Society of London. Address of George Bellas Greenough, F.R.S. &c., President. 24th May, 1841.—*From the Society.*

Académie Royale de Bruxelles. Extrait du Tom. VI. No. 10, des Bulletins. Note sur la Température de l'Eau de Puits, par W. H. White, &c.—*From the Author.*

On the Theories of the Weather Prophets, &c. By W. H. White, Secretary of the Meteorological Society of London, &c.—*From the same.*

Report, by Mr. O'Sullivan, to the Legislature of the State of New York, on the subject of Capital Punishment, 14th April, 1841.—*From the Author.*

The American Journal of Science and the Arts. Conducted by Pro-

fessor Silliman and B. Silliman, Jun. Vol. XLI. No. 2. Oct. 1841.—*From the Editors.*

The American Journal of the Medical Sciences. By Isaac Hays, M.D., &c. Oct. 1841.—*From the Editor.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D., &c. N. S. Vol. I. No. 3.—*From the Editor.*

Academical Lectures on the Jewish Scriptures and Antiquities. By John Gorham Palfrey, D.D. 2 Vols. 8vo. Boston, 1838, 1840. *From the Author.*

Dr. Bache, from the Committee, consisting of the Secretaries, to whom were referred on the 26th of June, 1840, the communications of Mr. Du Ponceau and Mr. Fisher, relating to the early history of the Society, presented a report, which was read. At the request of the President, who was absent in consequence of indisposition, the consideration of this report was postponed till the next meeting.

The Committee, consisting of Mr. Kane, Mr. Breck, and Judge Hopkinson, to whom was referred a letter from Mr. John B. Murray to Mr. Vaughan, which was read at the last meeting, made report.

Mr. Murray's letter communicates a proposal from some gentlemen, members of the Printer's Pension Society of London, to present to this Society a printing press at which Dr. Franklin worked while in England, provided a pecuniary gift or endowment be made in return to the Printer's Pension Society, and the Philosophical Society engage that the press shall be accessible to the public.

The Committee express their sense of the liberal exertions of Mr. Murray to promote the interests of the Society, but for reasons which they detail, recommend that the proposal communicated in his letter be declined.

The Society concurred in the recommendation, and declined Mr. Murray's proposal.

Dr. Harlan presented a communication entitled, "Description of the Bones of a nondescript fossil Animal, of the order Edentata, allied to the Megatherium, Megalonyx, Clamyphorus, Orycteropus, &c. &c., by R. Harlan, M.D.;" which was read and referred to a committee.

Dr. Hays made some additional remarks on the new variety

of the Tetracaulodon, which he had noticed at the last meeting.

He called the attention of the Society to four specimens, which he had placed on the table. 1st. A cast of the lower jaw of the Tetracaulodon, described by Dr. Godman, and figured in our Transactions, Vol. IV. N. S., Pl. xxvi. 2d. A fragment of a lower jaw of the same species, belonging to our Cabinet, described Vol. IV. N. S., Trans. Pl. xxix. 3d. The portion of a lower jaw of a young Tetracaulodon, exhibited at the last meeting; and 4th, One similar, from the collection of Mr. Koch, and which he stated he was enabled to submit to the inspection of the members, through the liberality of the owner.

He called attention to the circumstance, that the alveoli for the tusks in the first and second of these specimens were alike in form, depth and direction, but that there was a marked dissimilarity in these respects between them and those of the third and fourth specimens; the latter being also like each other. In the two former the alveoli are nearly cylindrical, and extend nearly to the inner table of the chin, leaving at their base merely a thin plate of bone: whilst in the two last the alveoli are conical, and so superficial as to leave a space of nearly two inches between their base and the posterior surface of the chin.

NOTE.—By an error in the typographical arrangement of the table of longitudes in the last Number, at page 66, a blank has been introduced after "Worcester," in the 24th line, of the 3d and 4th columns. This blank should have been in the first line, after "Boston," and the figures in those columns from the first to the 24th line inclusive, should have stood, each of them, one line below their present place—thus:

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PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. NOVEMBER & DECEMBER, 1841. No. 20.

Stated Meeting, Nov. 5.

Present, thirty-three members.

Dr. PATTERSON, Vice President, in the Chair.

Letters were received and read:—

From the Royal Society of Göttingen, dated April 20, 1841,—the Royal Society of Copenhagen, dated 3d May, 1841,—the Royal Academy of Inscriptions and Belles-Lettres, Institute of France, dated 20th August, 1841,—the Royal Academy of Sciences, Institute of France, dated 23d August, 1841,—and the Royal Geological Society of Cornwall, dated Penzance, 25th Sept, 1841; severally acknowledging the receipt of copies of the Transactions and Proceedings of the Society, and transmitting donations to the Library:—

From the Secretary of the London Electrical Society, dated 7th July, 1841, presenting the entire series of the Transactions and Proceedings of that Society:—

From Mr. Charles Nagy, dated Vienna, 10th March, 1841, accompanying donations to the Library, and referring to experiments, making under his direction, with the invariable pendulum:—

From Professor Palfrey, dated Boston, 28th Sept. 1841, presenting a copy of his Lectures.

The letter of Mr. Nagy was referred to a committee.

The following donations were announced:—

FOR THE LIBRARY.

Flora Batava. No. 122. Amsterdam. 4to.—*From H. M. the King of the Netherlands.*

Laws of Pennsylvania, passed at the Session of 1841. 8vo.—*From the Commonwealth.*

Verhandlingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. XVIIde Deel. Batavia, 1839. 8vo.—*From the Batavian Society of Sciences.*

The Transactions and the Proceedings of the London Electrical Society, from 1837 to 1840. London, 1841. 4to.—*From the Society.*

Proceedings of the London Electrical Society, Session 1841–42. Parts I. II. London. 8vo.—*From the same.*

De l'Application des Axiomes de la Mécanique et du Calcul Géométrique aux Phénomènes de l'Électricité, par Richard Laming. Paris, 1839. 8vo.—*From the same.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. I. Nos. 5, 6.—*From the Society.*

Historia Academiæ Scientiarum Pazmaniæ Archi-Episcopalis ac M. Theresianæ Regiæ Literaria. Buda, 1835.—4to.—*From Mr. Charles Nagy, of Hungary.*

M. Tudós Társasági Névkönyv Astronomiai Naplóval és Kalendáriommal, 1841-re. Buda. 12mo.—*From the same.*

Az égi és földtekék' használata, &c. Bécsben, 1840. 12mo.—*From the same.*

Auswahl aus den Diwanen des Mewlana Dschelaleddin Rumi. Vienna, 1838. 4to.—*From Mr. J. G. Schwarz, of Vienna.*

Armenische Vorschriften und Kalligraphien herausgegeben von P. A. B. &c. 2 Nos. Vienna, 1837. 4to.—*From the same.*

Verzeichniss der Chinesischen und Japanischen Münzen des K. K. Münz-und Antiken-Cabinetes in Wien, &c., von Stephan Endlicher. Vienna, 1837. Fol.—*From the same.*

Catalogue of Skulls of Man and the Inferior Animals, in the Collection of Samuel George Morton, M.D., &c. &c. Philadelphia, 1840.—*From the Author.*

Review of the Crania Americana, from Silliman's Journal.—*From the same.*

Memoir of William Maclure, Esq. &c. By S. G. Morton, M.D. &c. 1841.—*From the same.*

Lettre sur le Rhopalodon, genre du Saurien Fossile du Versant Occidentale de l'Oural, par G. Fischer de Waldheim, &c. &c. Moscow, 1841. 8vo.—*From the Author.*

Catalogue of the Officers and Students of Bowdoin College. 1841.—*From Mr. D. R. Goodwin.*

Société Royale et Centrale d'Agriculture: Bulletin des Séances. Tome II. No. 5. June, 1841.—*From Mr. D. B. Warden.*

Tracts. Catalogues of Collections of Rocks, Fossils and Petrifactions, published by the Heidelberg Mineralogical Institute, 1841. Plusieurs Rapports à la Société d'Agriculture, &c., par M. le Baron de Mortemart de Boisse, Rapporteur. Des Haras en France, &c. &c. &c.—*From the same.*

The American Medical Library and Intelligencer, &c. N. S. Vol. I. No. 4. By Robley Dunglison, M.D. &c. &c.—*From the Editor.*

The Charter of Privileges, granted by William Penn,—and Laws of the Government of Newcastle, Kent and Sussex, upon Delaware. Philadelphia, 1741. Fol.—*From Mr. Meigs.*

FOR THE CABINET.

Typographical Specimens, from the Typometry of Mr. Raffelsperger, of Vienna, including Maps, Portraits, &c.—*From Mr. J. G. Schwarz, of Vienna.*

The Committee, consisting of Dr. Horner, Mr. Wetherill, and Dr. Goddard, to whom Dr. Harlan's paper entitled, "Description of the Bones of a Fossil Animal of the Order Edentata," was referred at the last meeting, made a report recommending its publication in the Transactions; which was ordered accordingly.

These bones form part of the extensive collection of fossils recently exhibited in Philadelphia, by Mr. A. Koch, by whom they were obtained in Benton County, Missouri.

Among them, more or less perfectly preserved, are two ossa humeri, two tibiæ, two portions of the radius, two of the clavicle, parts of several ribs, twelve vertebræ, a cubitus, twenty-four teeth, eight of them in their sockets, two fragments of a lower jaw, with two and three teeth *in situ*, two fragments of the upper jaw, five ungueal pha-

langes, the sternum of four articulated pieces, and a part of the ilium and sacrum.

These specimens apparently belonged to three individuals of the same species. They were found, with portions of a mastodon, in company with numerous tropica' vegetable remains. They are friable and light, not petrified, but destitute of animal matter.

The teeth are very similar in structure to those of the Megalonyx, though the pieces of the lower jaw are stouter: the jaws may have contained six or seven teeth on each side.

The largest os humeri is twenty inches long, and fourteen in diameter; it is of a massive structure, and deeply grooved by the muscular attachments. In place of a foramen, as in the humerus of the Megalonyx, the exterior surface, near the elbow joint, has a deep groove, for the origin of the flexor muscles. The condyles are of great breadth, as in the Megatherium. The inferior articulating surface consists of two facets, one exterior and convex, the other described by Dr. Harlan as concavo-convex, admitting a ginglymous and rocking motion.

The cubitus or ulna is a short and strong bone, with strong marks of muscular attachments: this was part of an animal of less size than that to which the large humerus belonged. A peculiarity of this bone consists in the position of its superior articulating surface, which is nearly in the middle of its shaft; the olecranon process being very long, and extending upwards. The lower articulating surface was articulated with the carpal bones, as well as the radius. The total length of this bone is sixteen inches.

There are four claws, or phalangeal bones of the fore-foot of a small-sized individual: in general form these bones approach nearest to those of the Orycteropus.

There are two tibiæ belonging to different individuals of different sizes: one is ten inches five-tenths in length, the other ten inches. This is a short, thick and strong bone. Its upper articulating surface is nearly a circular concave disc. Its lower anterior extremity is marked by a peculiar deep ovoid depression, or hollow, for the reception of a corresponding hemisphere, projecting upwards from the astragalus; forming together, a structure of joint altogether unique. The motions of the ankle joint were rotatory, but the articulating surface of the lower aspect of the astrogalus admitted of ginglymous motion with the os calcis.

The clavicle and ribs, portions of which only exist, are not distinguished by any remarkable characters: but the foramen for the pas-

sage of the spinal marrow, in the vertebræ, is exceedingly small. an unaccountable feature in a skeleton, which in all other respects, demonstrates great physical strength as one of its most remarkable characteristics.

The portion of sternum belonged most probably to the largest of the three individuals; the animal being apparently less than the Megatherium and larger than the Megalonyx.

Dr. Harlan proposes to name this animal "Orycterotherium Missouriense."

Professor Henry, of Princeton, gave a verbal account of a series of experiments he had made on Magnetic Distribution, and which he intended to present as the fifth number of his contributions. A full account of these experiments will be given hereafter.

Professor Henry also gave an account of some observations he had made on the effects of a thunder storm which visited Princeton on the evening of the 14th of July, 1841.

Storms of this kind, he said, are not very frequent at Princeton: but two severe ones have passed immediately over the place within the last nine years, and the lightning has struck but twice in the village, during the same time. It is thought by some of the inhabitants, that damage by lightning was more frequent some years ago than it has been lately; and the idea has been suggested that the water of the canal, which passes to the south of this place, may have had some effect in determining the course of the cloud. Be this as it may; the thunder storm generally comes from the south-west, and before it reaches the village it usually divides into two parts, one of which passes along the edge of Rocky Hill, and the other along the valley of Stonybrook, so that the principal part of the storm seldom passes immediately over the village; and when it does thus pass it is generally at a great elevation, and the thunder is not so loud as that which the observer has been in the habit of hearing at the north. In connection with this remark, Prof. Henry mentioned, that he has several times observed the lightning assume a beautiful violet colour, similar to that of the vapour of iodine, and this was particularly the case during a storm which occurred on the 12th of April, 1840. On this occasion, although the cloud and the flashes appeared directly over head, yet the sound of the thunder seemed to come from a distance. The peculiar colour may, perhaps, receive a sufficient explanation, by refer-

ring it to the fact of the discharge taking place at a great altitude, and consequently in comparatively rarefied air, as in the case of the colour exhibited by the spark through a vessel partially exhausted.

The storm of the evening of the 14th of July, was said to be more severe than any which had visited Princeton for twenty years before. It commenced between 7 and 8 o'clock, and lasted about three hours; the thunder was almost continuous, but, except in two or three cases, it was not very near. Several buildings and other objects were struck in the vicinity of Princeton, and also Mrs. Hamilton's house, which is situated in the village, about 20 rods west of the college, on the opposite side of the way. It seemed a little surprising that this house should be singled out, since the buildings on either side are considerably higher, although at a few rods distance; and in front of the one to the west is a number of tall trees. The house is also furnished with a lightning rod; but this, like most of the rods erected in the country, is not formed in accordance with the most scientific principles. The front of Mrs. Hamilton's house is parallel with the main street, and is nearly in an east and west direction. The building is of brick, with a shingle roof, and two stories high: it has on the front three upper windows, and two windows and a door below; the latter being immediately under the western upper window. The chimney is on the eastern end, and the lightning conductor is supported against this. The rod is formed of round iron, three-eighths of an inch thick, and the several parts of it are imperfectly connected by hooks and eyes. It appears to be merely thrust into the ground to the depth of about two feet, and is terminated above by three prongs instead of one; the points of which are blunted by long exposure, but do not exhibit any appearance of fusion. The top of the rod is not more than six feet above the ridge of the roof; and since the house is about thirty feet long, the farther end of the ridge is unprotected. A point, according to the experiments of Mr. Charles, can only protect a circular space, the radius of which is not greater than twice the height of the point above the plane to be protected.

The lightning, according to the accounts of several persons, came from a cloud situated to the south-west, and the discharge did not strike the most elevated part of the building, but the western end of the horizontal wooden gutter which extends along the front of the house under the eaves. This point is at the greatest possible distance from the extremity of the lightning rod, and perhaps as near to the cloud as any other part of the building. The discharge immediately divided itself into two parts: one of these, and probably the larger,

passed along the gutter, which must have been filled with water at the time, to the eastern end of the same, and then down to the earth along an ordinary tinned-iron pipe or conductor, which conveys the water from the gutter to the pavement below. Marks of its passage were observed along the gutter, and particularly near the end next the metallic conductor. The other part of the discharge passed immediately downward through the end of the gutter which first received the shock, to the casing of the window below; and was probably thus deflected out of its course by the attraction of the iron hinges and bolts of the shutters. Its course to the ground was further traced along the casings on each side of the front door. The wood was cracked at every place where a nail happened to be in the line of the discharge, and at some places the lightning appeared merely to pass along the surface making a groove in the wood of about one-eighth of an inch in width, and six or seven inches long: several of these grooves were observed on the side casings of the door. Three panes of glass were broken in the window above the door, and the pieces were thrown inward. The entrance within the door was filled with dust, and a strong sulphurous odour was perceptible for an hour or more after. No marks of a discharge were found at the foot of the lightning rod.

During the storm, several females were alone in the house, and at the time it was struck, three of these were in the front room in the second story, and consequently near the line of the discharge along the gutter. Two were on a bed placed against the partition wall, opposite to the front, and the third female was standing on the floor about eight feet from the front window, with her face to the same. Those on the bed were unaffected; but the one on the floor stated that she felt a sensation on her right ear, as if it had been touched with a live coal; at the same time she felt a rushing sensation down her side and perceived a flash at her foot, and a forked spark in the air between her and the nearest window. One of the persons on the bed also stated that she saw the forked spark in the air, and that the female on the floor appeared to her for an instant as if surrounded with light. The outside shutters of the window opposite to which the female was standing, were closed, and also one leaf of the shutters of the window farther east. The western window, or that from which the glass was broken, was not in the same room, but in a small adjoining one, over the main entrance from the front door. The chamber door was shut at the time, and no marks of the entrance of the

electricity into the room could be found on the walls or on the casings of the two windows.

The principal facts here detailed, although perhaps not unusual occurrences, afford interesting illustrations of the action of electrical induction. First, the horizontal gutter and the vertical tin pipe, both filled with water, formed a long continuous electrical conductor, extending from the point where the lightning first struck to the lower farther corner of the front of the house; and this conductor, on account of its length, would be intensely affected by the induction of the distant cloud, or rather by that of the approaching discharge. If the electricity of the cloud were positive, then that of the water in the nearest end of the gutter would be negative, and, consequently, a powerful attraction would determine the lightning on the point where it struck. The house, under these circumstances, might have been damaged even had the rod been much higher than it was, and its connection with the earth much more perfect.

Again, the phenomena exhibited to the females in the upper chamber were also most probably due to inductive action. After a proper allowance for imperfect observation, occasioned by the fright and confusion of the moment, it is still evident that the female on the floor was in some degree affected by the discharge, although none of the electricity of the cloud actually entered the room, since no traces of it were to be found on the walls or other parts. The effects may therefore be referred to the inductive action of the lightning at a distance and through the wall, as it passed along the gutter across the front of the house. When a shock of electricity from a Leyden jar is passed through a slip of tinfoil pasted on one side of a pane of glass, the hand on the other side will receive a slight sensation from the lateral induction through the glass. In the same way, it may be supposed, that the effects perceived by the females were due to the disturbance for an instant of the natural electricity of the chamber, by the passage of a large charge along the outside of the house.

The discharge, as has before been stated, came from the southwest, and in its passage it crossed obliquely some houses on the opposite side of the street. In one of these, two persons were sensibly affected by the shock; and another, in a room with the windows closed, according to her own statement, saw sparks of electricity on the floor. The same explanation will also apply to these effects.

During the same storm, another house about three miles southwest of the village was struck, and this also was furnished with an imperfect conductor. The upper part of the rod had been broken,

and it hung down, so that no part was above the chimney. The lightning struck the eastern chimney, which was on the end of the house opposite to that to which the rod was attached, and passed down the inside of the flue to the kitchen fire-place, in which wood was burning at the time. It threw down a great quantity of soot, filled the lower rooms with smoke, and diffused, according to the account, a strong smell of gunpowder. A part of the charge passed to the outside through the thick stone wall which forms the back of the chimney, and was evidently attracted by the iron hoop of a large cask which was nearly against the wall. It made a triangular hole, as if the stone and mortar had been burst outwards by an explosive force, and this was directly opposite the nearest part of the hoop. It then descended along the cask to the ground, breaking off all the wooden hoops in its course, while those of iron were undisturbed. The house is about sixty feet long; and from the state of the rod, the greater part of this distance might be considered as unprotected. The stroke fell on the end most remote from the approaching storm, and probably the lightning was drawn to this chimney rather than the other on account of the heated air which was escaping from it at the time.

Effects were also produced in this case, which can only be explained on the principles of induction. Three persons, the man of the house, his wife and son, all took refuge on a bed in a room separated from that through which the chimney passes, and upwards of twenty feet from the line of the electrical discharge. They were all lying across the bed, with their feet hanging down the side, and they each received a shock in the knees and lower joints of the legs. The female stated that the feeling was precisely like that which she had experienced from a shock from an electrical jar. No marks of the entrance of any part of the discharge from the cloud were found on the plastering or any other parts of the room; the effect can therefore only be accounted for, by a sudden disturbance of the equilibrium of the natural electricity of the space within the room.

The induction of an electrical cloud is often exerted at an astonishing distance. It has long been known, that a delicate gold-leaf electrometer is sometimes affected by the presence of an electrical cloud immediately over head; but Dr. Ellet, professor of chemistry in the college of South Carolina, has informed Professor H., that if one of Dr. Hare's single-leaf electrometers be furnished with a pointed metal rod attached to the cap, and then placed on the sill of an open window in the upper story, the leaf will be seen to touch the

ball at the moment of a flash, although the lightning is several miles distant.

Prof. Bache gave an account of the formation of cumulus cloud from the action of a fire, as witnessed by him in the month of August last, at Ellicottville, in the state of New York.

The place where this phenomenon was observed is nearly surrounded by hills; the valley in which it is situated extending to the southward. Near the foot of the hills on the north side of the village, a fire was made of the heavy timber which had been felled in clearing a small tract of land. The column of heated air from the fire, made visible by the smoke and condensing vapour, rose almost vertically, widening irregularly as it rose, curling over at the sides and reaching various heights. On one occasion, when the height of the column, judging from the known distance of the fire and the angle of elevation, was about three-tenths of a mile, the top flattened out, presenting a mushroom appearance. The smoke having been left behind in the ascent of the heated air, the condensed vapour forming the top of the column and presenting precisely the appearance of a cumulus cloud, was carried slowly to the westward; rising gradually and at first enlarging itself, it next became feathery at the edges, and finally disappeared. The lower current of air was from the S. W., and moderate in force. An upper current, as shown by the direction of the small cloud just described, was passing at a small elevation from the N. N. W.

A second time a small cumulus cloud formed, at the distance of about two hundred yards above the smoke from the fire, and without visible connexion with it. This cloud enlarged in its ascent until, when about the same height as the former cloud, it began to move from the N. N. W. It next separated into two parts, one rising rapidly, and in turn breaking into two portions; the whole three small masses thus formed being carried slowly from the N. N. W., and the two lower ones gradually disappearing. A detached cloud of the same kind gradually formed to the leeward of the upper remaining one, presenting the general appearance, upon a small scale, of the detached masses which may be seen to form in the neighbourhood of thunder clouds in the summer season.

These observations were made on the 16th of August, between 1½ and 2 P. M. The temperature of the air was 80°, the evaporating point 64°, and the height of the barometer 28.74 inches. From these

data the dew point may be calculated by Dr. Apjohn's formula to have been 52° 9.

The report, presented at the last meeting by the Committee on the Communications of Mr. Du Ponceau and Mr. Fisher, was considered, and the resolution with which it closed was adopted.

The Committee review in their report, the papers which were referred to them, and take notice also of some additional facts that bear upon the same subject. In conclusion, they congratulate the Society on the important accession to the knowledge of our early history, which has resulted from the labours of Mr. Du Ponceau and Mr. Fisher. Yet it must be admitted, they say, that chasms still remain in our early annals which require to be filled up; that doubts exist on some points, and discrepancies of opinion on others. The question arises: Shall we give publicity to the Society's early history in its present imperfect state, or shall we delay in the hope of obtaining more facts? The Committee express themselves in favour of the latter course, and recommend the adoption by the Society of the following resolution:

Resolved, That the papers of Mr. Du Ponceau and Mr. Fisher, which were read on the 26th of June, 1840, together with the supplementary communications, be deposited in the Archives, as valuable contributions to the early history of the Society.

Mr. Du Ponceau, by permission of the Society, withdrew his communication for the purpose of revising it.

Stated Meeting, November 19.

Present, seventeen members.

Dr. Patterson, Vice President, in the Chair.

A letter was received and read from Jac. Berzelius, Perpetual Secretary of the Academy of Sciences of Stockholm, dated 28th September, 1841, acknowledging the receipt of the Transactions and Proceedings of the Society.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Geological Society of London. Vol. III. Part 2. No. 77. 1841. 8vo.—*From the Society.*

Proceedings of the Botanical Society of London, from July, 1836, to Nov. 1838. 1839. 8vo.—*From the Society.*

Ad Runographiam Scandinaviæ Accessiones Novæ. Upsal, 1833. 4to.—*From Mr. Du Ponceau.*

Vocabularium Værendicum. Upsal, 1839. 8vo.—*From the same.*

Kort Beskrifning om Provincien nya Swerige uti America, Com nu förtjden af the Engelske kallas Pensylvania, af Thomas Campanius Holm. Stockholm, 1702. 4to.—*From Professor J. H. Schröder, of Upsal.*

Maison de Commission pour l'Etranger, de Hector Bossange, &c. Paris, 1841. 8vo.—*From M. Bossange.*

Notes on the Use of Anthracite in the Manufacture of Iron, &c. By Walter R. Johnson, A.M. Civil and Mining Engineer, Professor, &c. &c. Boston, 1841. 8vo.—*From the Author.*

FOR THE CABINET.

An Engraved Portrait of Alexander Von Humboldt.—*From Mr. John Penington.*

Messrs. Saxton and Gobrecht of the U. S. Mint, presented an engraved Seal for the use of the Secretaries.

The Committee, consisting of Professor Bache, Dr. Patterson and Professor Henry, to whom Mr. Nagy's letter was referred at the last meeting, presented a report; and in pursuance of their recommendation, it was resolved by the Society, that Mr. Nagy of Vienna be informed that the Society will be pleased to receive an account of his pendulum researches, and also the invariable pendulum with which they were made; and that they will defray the expenses of receiving and returning the instrument, and will cause a corresponding series of observations to be made at Philadelphia.

Dr. Bache announced the decease of Gen. Thomas Cadwalader, a member of the Society, on the 25th ult. in the 61st year of his age.

Dr. Bache reported, that by an arrangement among the Se-

cretaries, not heretofore communicated, Dr. Dunglison had been charged with the correspondence of the Society for the present year.

Stated Meeting, Dec. 3.

Present, twenty-five members.

Dr. Patterson, Vice President, in the Chair.

Letters were received and read—

From the Massachusetts Historical Society, dated Boston, 18th Nov. 1841; the National Institution, dated Washington, 26th Nov. 1841; H. J. Bowditch, Esq. of Boston, dated 13th Nov. 1841, and the Rev. David Thom, of Liverpool, dated 13th Oct. 1841; transmitting donations to the Society, and acknowledging the receipt of its Transactions and Proceedings.

The following donations were announced:—

FOR THE LIBRARY.

Account of the Anniversary Meeting of the Numismatic Society of London, June, 1841,—and Mr. A. J. Stothard's List of British Medals.—*From the Numismatic Society.*

Esop's Fables in Chinese. By Sloth. (Robert Thom, Esq, British Interpreter, at Canton.) 1840. Fol.—*From the Rev. David Thom.*

The Chemical Catechism, by the late Samuel Parkes, &c. &c. 13th Edition, by E. W. Brayley, Esq. of the London Institution, &c. &c. London, 1834. 8vo.—*From the Editor.*

Address before the Phi Beta Kappa Society of Bowdoin College, 2d Sept. 1841. By Alden Bradford, Esq. &c. &c.—*From the Author.*

Introductory Lecture to a Course on the Principles and Practice of Surgery, in the University of Pennsylvania, Nov. 1841. By William Gibson, M.D. &c.—*From the Author.*

Introductory Lecture to a Course on the Institutes of Medicine, in the University of Pennsylvania, Nov. 1841. By Samuel Jackson, M.D. &c.—*From the Author.*

Mr. Nuttall presented a communication, entitled "Description and Notices of New or Rare Plants, collected in a Journey over the Continent of North America, and during a Visit

to the Sandwich Islands and Upper California, by Thomas Nuttall;" which was read and referred to a committee.

Professor Henry D. Rogers read a communication by his brother, Professor William B. Rogers, and himself, entitled, "Observations on the Geology of the Western Peninsula of Upper Canada, and the Western part of Ohio;" which was referred to a committee.

The authors commence by expressing their views of the importance of determining the relations of the rocks of the western states to the formations of the Appalachian system, as they are developed in New York, Pennsylvania and Virginia. They deem this comparison essential to the full understanding of those gradations in type which elucidate the physical changes that accompanied the production of the strata. The difficulties of the investigation are then alluded to, consisting in these very changes of type, the horizontality of the rocks, the deep covering of drift which so generally conceals them, and the interruption of their range from western New York into Ohio, caused by the waters of Lake Erie.

The direct comparison of the western formation with those of the Appalachian chain being precluded by the changes which the formations undergo in the interval; it was deemed essential to establish, if possible, their relations by a continuous tracing from Pennsylvania through New York, and thence keeping some easily recognised horizon steadily in view, to work round Lake Erie through Upper Canada and Michigan, and by this means form a junction with the strata of Ohio.

Range of the Niagara Limestone.—In following some of the formations of the Niagara River, through Upper Canada, the course of the Niagara limestone, which forms the escarpment of the mountain ridge, was traced westward from Queenstown to the head of Lake Ontario. It then sweeps round the head of the lake, and again changing its strike, takes a N.N.W. direction to the southern end of Lake Iroquois, or Georgian bay of Lake Huron. A section of the formation is then given in the neighbourhood of Ancaster, about fifty miles west of Niagara. It shows a slight change in the lithological character of some of the strata, accompanied by an increase of thickness of the general mass as traced westward.

The Gypsum Shales are then traced in a belt south of the terrace, and shown to intersect the Welland Canal, and to follow the course of Grand River to the vicinity of Paris. From this point they strike north with the mountain ridge, and passing a little east of Guelph,

stretch northward towards the southern end of Lake Iroquois. At Paris some of the beds contain the characteristic hopper-shaped cavities. The well-marked vesicular or pitted limestone of the top of the formation is likewise found here.

The Vesicular Limestone is next described and traced. This is a buff coloured, impure subcrystalline limestone, distinguished by its peculiar lenticular cavities. Being remarkable for the constancy of its features and its extensive range, it proved of great importance in ascertaining the super-position of the more variable strata that adjoin it, and was thus used as a horizon from the Niagara river through Upper Canada into Michigan and Ohio. It was traced northward, from Paris to the vicinity of Guelph, and was shown to lie below the south branch of the Thames at Beachville, but to immerge in the north branch of the same river about 40 miles above London.

On the Maitland river near Lake Huron, it is well exposed, with a group of overlying limestone. Though destitute of fossils, it was readily identified at all these points.

The Rocks overlying the Vesicular Limestone in Upper Canada are stated not to accord exactly with those which repose upon this rock in New York. The important changes which this part of the series undergoes in passing from the central counties of that state to the districts west of the Genesee, being first shown by citations from the annual reports of Mr. Vanuxem and Mr. Hall, evidence was afforded of still further modifications in Upper Canada. An opinion was expressed that the corniferous and Onondaga limestones thin out entirely before crossing the peninsula to Lake Huron, and that the hydraulic and Seneca limestones must likewise vanish, or greatly change their type. On the Maitland river, near Goderich, where there is a well exposed section; the vesicular limestone forming the bottom of the group; none of the formations seen east of Buffalo could be recognised. In a section of the strata exposed in the cliffs of the Maitland, the pitted rock is described as immediately overlaid by dove coloured and bluish limestone, sometimes of a sparry texture, abounding in fossils. No attempt was made to determine with precision the relations of this formation to the strata of western New York, as no instance occurred where it was found in company with the Onondaga rock or its associates; but the opinion is expressed that it occupies a position high among the limestones which underlie the Marcellus shales. One reason for so placing the Maitland rock, is its obvious identity with the limestone of Sandusky, the infraposition of which to the Marcellus shales can readily be shown. This identity is made to rest on a comparison of fossils, and on an actual tracing of the pitted

rock and the Maitland limestone from Canada round the head of Lake Erie. Another motive for thus referring the Maitland rock, is found in the affinity which prevails between its fossils and those of the Onondaga, Seneca and Marcellus strata. Of the species examined, it contains in common with those formations, atrypa affinis, also an atrypa common at Schoharie, strophomena lineata, a delthyris, common to the Onondaga limestone and to the shales next above that rock in Pennsylvania (Marcellus shales); also cyathophillum ceratites, and a trilobite of the Onondaga limestone. Though these links indicate a somewhat near approximation in date, they are not regarded as proving the rock an equivalent of any of the formations mentioned. None of the organic remains are characteristic of any of the strata lower than the Onondaga limestone. What seems most conclusive however of the high position of the Maitland stratum, is its identity with the limestone of Sandusky, the plane of which is but little under the horizon of the Marcellus shales.

Rocks of the Detroit River, and of the western end of Lake Erie. The persistence of the pitted rock through Upper Canada being ascertained, the next point was to discover the relations of it and the overlying limestones to the strata widely developed about the head of Lake Erie. Uniting the facts collected of the dip and range of the strata in Upper Canada, with the statements contained in the annual reports of Dr. Houghton, the State Geologist of Michigan, it was inferred that a gentle axis of elevation passes in a south-south-west direction near the lower end of Lake Huron, forming the northern portion of that broad anticlinal rise of the rocks which divides the upper formations of Ohio from their equivalents in Indiana. It was therefore suspected that the pitted limestone and other strata would depart from their north-western strike, seen in Canada, and range in obedience to this axis towards the south-south-west. Should such be the case, it was hoped to unite by actual tracing the rocks of Michigan and Ohio with those of Canada and New York. Pursuing the formation south-westwardly by the borders of Detroit river, Lake Erie and the Maumee, these anticipations were realized.

The Fossiliferous Rocks of the Detroit River, both in Canada and Michigan, are readily identified by their composition and organic remains with the limestones which overlie the pitted rock on the Maitland. But the pitted rock itself in Gros Isle, at the mouth of the Detroit river, in a position proving its immediate subjacence to these strata, fortunately places this identity beyond a doubt. It is an arenaceous cream coloured limestone, abounding in the characteristic

lenticular cavities, and as usual destitute of organic remains. Its elevation above the level of the river cannot exceed eight feet: its extremely slight dip towards the north-west is perceptible.

The overlying limestones are well seen on the western side of the river, one mile from the village of Truago in Monguagon. The most common variety of the rock at this place is a light grey, somewhat sparry limestone, which becomes yellowish and mealy by weathering. It strongly resembles the limestone of the Maitland, and that seen in the bed of the Thames at Beachville. It has an inconsiderable dip towards the north-west. The same strata are displayed in a series of quarries on the Canada side, about two miles from Malden. The dip here is scarcely noticeable: if any prevails, it is westward. The Truago and Malden beds manifestly overlie the vesicular rock of Gros Isle, and agree in their fossils with the similarly placed limestone of the Maitland. They contain strophomena lineata, another strophomena, atrypa affinis, also another atrypa, septæna, orthoceratites, cyathophillum, ceratites, favosites, encrini, a trilobite, and several fossils not yet determined.

Rocks of the Maumee River and of Sandusky Bay.—On the Maumee, in Ohio, the pitted limestone is again met with, under features identical with those of the rock seen at Gros Isle and Goderich. Its occurring thus so exactly in a line with the two last named places, goes unequivocally to establish the anticlinal axis supposed to pass from the western part of Canada into Ohio. This axis crosses Lake Erie probably about midway between the head of the lake and the chain of islands stretching from Point du Playe to Point Sandusky. An examination of the fossils of the Sandusky limestone establishes beyond a question its identity with the formation exposed at Malden, Truago and Goderich. This agreement is the more interesting, since the Sandusky rock, under the name of the cliff limestone of Ohio, has by some geologists been regarded as the equivalent of the European carboniferous or mountain limestone. But an inspection of its organic remains shows that its closest foreign relations are to the Wenlock limestones of the English silurian strata. There exists moreover in Tennessee and Virginia a higher limestone, not seen in Ohio or New York, much more accurately referrible to the European mountain limestone, and so regarded by Prof. Troost, in his annual reports and other communications on the geology of Tennessee. This rock, characterized by its oolitic structure, and the beautiful genus pentremites, seems, from the descriptions given, to overlie the cliff limestone of Ohio.

The extensive anticlinal line, traced from the western side of Canada to the Maumee, crosses the Ohio river somewhere in the vicinity of Louisville, and terminates probably in Kentucky, imparting a general south-south-west strike to all the strata of western Canada, eastern Michigan, Ohio and Indiana. The lowest formation near Lake Erie which the axis elevates to the surface, is the pitted limestone. But further to the south-south-west, still lower formations appear; the cliff limestone, at the base of which we place the pitted rock, being underlaid, according to Dr. Locke, by marly shales, that rest upon an extensive formation of blue limestone, well exposed around Cincinnati. These shales are regarded by the authors of the paper as representing the gypsum shales of New York. Influenced by a certain degree of correspondence in the fossils of the Cincinnati limestone, and by other considerations, they view this latter formation to be approximately contemporaneous with the Niagara or Lockport limestone, but to include beds nowhere met with in New York. Apart from the indications afforded by the fossils, a reasonable inference is drawn from its progressive thickening westward, that it ranges at least as far as the axis on the Ohio. The Cincinnati limestone, occupying the same position below the shales under the pitted limestone, as the Niagara formation, may, if we use the term with proper restrictions, be regarded as its equivalent. In thus viewing the limestone of Cincinnati, the authors find their conclusions at variance with those of Mr. Conrad, for whose researches in Palæntology they avow the highest respect. In his last annual report, that geologist regards the limestone of Cincinnati as the equivalent or continuation of the black limestone of Trenton falls in New York. But to bring up a formation so low in the Appalachian series, the anticlinal axis must previously elevate, not only the gypseous and Niagara strata, but the prodigiously thick groups of shales, limestones, slates and sandstones, which rest above the Trenton limestone, and which, if thus elevated, would have conferred upon Ohio, Indiana and Kentucky, a wholly different geology, with a mineralogical character and physical geography unlike those which now belong to them.

In conclusion, a simple generalization is presented of the results arrived at respecting the range and distribution of the Niagara river rocks. The strata overspreading the plain, bounded by the mountain terrace, are conceived to decline gently to the south-west in Upper Canada and Ohio, while the flat but extensive anticlinal axis traverses the slope from Kentucky to the western side of Upper Canada. In these two conditions the authors find a reason, first, for the general

north-western strike of the pitted rock, which carries it in the direction of the mountain terrace to Cabot's Head and the Manitouline islands; and secondly, for that extensive south-western strike, which affects the same stratum in another outcrop as far south as the Maumee, and sends the overlying and next subjacent rocks in a broad zone from Lake Erie across the Ohio river into Kentucky and Tennessee.

Professor Bache called the attention of the Society to a Memorial to the House of Representatives of the U. S., which had been laid on the tables, soliciting the action of Congress to effectuate the reduction of the different Astronomical Observations, which are on the files of the Navy Department, or to be found in the Transactions of different learned Societies of this country; with a view to the determination of the longitude of the Capitol at Washington, and other principal stations in the United States. Professor B. explained the views expressed in the Memorial, and invited for it the signatures of the members.

Mr. Justice mentioned, that recent observations of the moon, made by him with the great telescope at the High School Observatory, confirmed the correctness of Maedeler's map of that satellite in the parts between Aristarchus and Herodotus, which are differently represented by Dermond.

Mr. Lea, from the Publication Committee, presented their annual report, detailing their proceedings during the past year.

The number of Subscribers to the published Transactions, is at this time, 109; there have been 69 copies distributed in exchange with other Societies, &c., and 15 copies sold to non-subscribers. The balance of funds in the hands of the Committee is $685.12.

Stated Meeting, December 17.

Present, twenty-three members.

Dr. CHAPMAN, Vice President, in the Chair.

Letters were received and read—

From the Royal Academy of Turin, dated 21st Aug. 1841, acknowledging the receipt of the Transactions and Proceed-

ings, and asking the renewed transmission of some numbers that are wanting to complete their sets:—

From the Chief of the Engineers of Mines of Russia, dated St. Petersburg, $^{19}/_{31}$st July, 1841, transmitting donations to the Library:—

From the Library Company of Philadelphia, dated 16th Nov. 1841, acknowledging the receipt of donations from the Society:—

From Mr. William Amies, dated Philadelphia, 10th Dec. 1841, making a donation to the Society of a painting emblematic of the American Union, executed in 1784, by order of M. Barbé de Marbois, and by him presented to Charles Thomson, Secretary of the American Congress; together with a copy of a Resolution of that Congress, passed 14th Jan. 1784, authenticated by Charles Thomson:—and

From Mr. John B. Murray, of New York, to the President, dated Liverpool, 19th Nov. 1841, offering to the Society's acceptance, as a donation from himself, the printing press on which Benjamin Franklin worked as a journeyman in London, in 1725–26.

The President was requested to express to Mr. Murray on behalf of the Society, the satisfaction with which they will receive the donation he has tendered.

The following donations were announced:

FOR THE LIBRARY.

Transits as observed, and Calculations of the Apparent Right Ascensions, 1834. London. 4to.—*From the Lords Commissioners of the Admiralty.*

Zenith Distances observed with the Mural Circle, and Calculation of Geocentric South Polar Distances, 1836. 4to. London.—*From the same.*

The Nautical Almanack, and Astronomical Ephemeris, for 1841. London, 1840. 8vo.—*From the same.*

Philosophical Transactions of the Royal Society of London, for the year 1841, Part I. London, 1841. 4to.—*From the Society.*

Proceedings of the Royal Society, 1841, No. 48. 8vo.—*From the same.*

Bessel's Refraction Tables. 4to. London.—*From the same.*

Annuaire Magnétique et Météorologique du Corps des Ingénieurs des Mines de Russie, &c. &c. St. Petersburg, 1841. 4to.—*From Count Cancrine, Chef du Corps des Ingénieurs, &c. of Russia.*

Nouveaux Mémoires de l'Académie Royale des Sciences et Belles-Lettres de Bruxelles, Tome XIII. Brussels, 1841. 4to.—*From the Academy.*

Mémoires couronnés par l'Académie Royale, &c. de Bruxelles, Tome XIV. 2me. Partie. Brussels, 1841. 4to.—*From the same.*

Académie Royale de Bruxelles:—Bulletins des Séances du 7 Oct. 1840, du 15 et du 16 Déc. 1840, du 6 Mars, 1841, du 3 Avr. 1841, du 6 et du 7 Mai, 1841, et du 5 Juin, 1841. Bruxelles, 1840–1841. 8vo.—*From the same.*

Traité Élémentaire des Fonctions Elliptiques, par P. F. Verhulst, &c. &c. Brussels, 1841. 8vo.—*From the same.*

Annuaire de l'Académie Royale de Bruxelles, 1840. Brussels, 1841. 12mo.—*From the same.*

Annuaire de l'Observatoire Royale de Bruxelles, 1841. Brussels, 1840. 12mo.—*From the same.*

Rapport Décennal des Travaux de l'Académie Royale de Bruxelles, depuis 1830; par Mr. A. Quetelet, Secrétaire Perpétual, &c. 8vo. *From the Author.*

Résumé des Observations sur la Météorologie, sur le Magnétisme, sur les Températures de la Terre, &c. &c. faites a l'Observatoire Royale de Bruxelles en 1840, par le Directeur A. Quetelet, &c. &c. Brussels, 1841. 4to.—*From the Author.*

Additional Note on the Contraction of Voluntary Muscle in the Living Body. By William Bowman, Esq. F. R. S., Demonstrator of Anatomy, &c. London, 1841. 4to.—*From the Author.*

A Few Notes on the History of the Discovery of the Composition of Water. By J. O. Halliwell, Esq. F. R. S. &c. London, 1840. 8vo.—*From the Author.*

Beiträge zur Lehre von den Haulkrankheiten. Von Dr. Th. A. O. Tellkampf. Vienna, 1839. 8vo.—*From the Author.*

Political Economy—its Uses, Objects, and Principles, &c. &c. By A. Potter, D.D. Professor, &c. in Union College. New York, 1840. 12mo.—*From the same.*

Academy of Natural Sciences of Philadelphia: List of Members and Correspondents, to 1st Sept. 1841: Proceedings, Vol. I. Nos. 7, 8. Oct. Nov. 1841.—*From the Academy.*

Catalogue of the Officers and Students of Yale College. 1841–42.—*From Professor Silliman.*

Catalogue of the Officers and Students of Dartmouth College. 1841-42.—*From Professor Hubbard.*

Charter and Laws of the Philadelphia Museum Company. 1840.—*From the Company.*

Reports on the Receipts and Expenditures of the County of Philadelphia, made by a Committee of the County Board, 13th Sept. 1841.—*From Mr. Vaughan.*

Professor Dunglison's Introductory Lecture to a Course of Institutes of Medicine, &c. in Jefferson Medical College, 1st Nov. 1841. Published by the Class.—*From the Author.*

Professor Meigs's Introductory Lecture to a Course on Obstetrics, in Jefferson Medical College, 4th Nov. 1841. Published by the Class.—*From the Author.*

Two Sermons on the Death of the Rev. Ezra Ripley, D.D. By Rev. Barzillai Frost and Rev. Convers Francis, D.D. Boston, 1841. *From Rev. Mr. Frost.*

The American Library and Intelligencer. New Series. Vol. I. No. 5. By Robley Dunglison, M.D. &c. &c. Nov. 1841.—*From the Author.*

FOR THE CABINET.

A Painting emblematic of the Union of the American States, executed 1784.—*From Mr. Wm. Amies.*

A Broad Sheet Copy of the Resolution of the Continental Congress, passed 14th January, 1784; authenticated by the autograph of Charles Thomson, Secretary.—*From the same.*

The Committee, consisting of Mr. Lea, Dr. Wood, and Professor Booth, to whom Mr. Nuttall's communication was referred at the last meeting, reported in favour of its publication among the Transactions; and it was ordered accordingly.

Mr. Espy exhibited an instrument, devised by himself, and which he calls the Nephelescope, intended to show the changes induced in the temperature of air by its greater or less rarefaction; and made several experiments with it in the presence of the Society.

Mr. Espy showed, that he was enabled by this instrument to determine the reduction of temperature, which air undergoes by expansion, whether in a dry state or when charged with moisture. He called attention to the cloud which was formed in moist air by the cold of expansion, and remarked that the latent heat evolved by this conden-

sation of vapour, counteracted the reduction of temperature produced by the expansion in a ratio which increased with the increase of temperature. Thus, he stated as the result of experiments, that an expansion occurring in air saturated with aqueous vapour, at a temperature of about 71°, produced an increase of temperature half as great as in dry air; and at a temperature of 102°, a similar expansion increased the temperature only one third as much as when the air was dry.

Mr. Espy went on to show, that by experiments made with this instrument, he had been able to make out a law, from which, when the temperature of the air and the dew point at the surface of the earth under the base of a forming cloud are known, the decrease of temperature can be determined up to the base of the cloud, and even to its top, though that should be ten miles high, as some great clouds in the summer are. And as the temperature of the air on the outside of the cloud is nearly known, being about one degree colder for every hundred yards in height, the specific gravity of the cloud can be known, when compared with that of the air surrounding it. Mr. Espy entered into a calculation to show that the air under the base of a forming cloud is colder about one degree and a quarter for every hundred yards above the surface of the earth, and that from the base of the cloud upwards it gets colder about one degree and a quarter for each two hundred yards of increased elevation. This calculation is founded on the supposition that there is an up-moving column of air under and in every forming cloud, as established in his PHILOSOPHY OF STORMS.

Mr. Espy went on to state, that it is ascertained, both by experiments made with the nephelescope and by calculations founded on the well known laws of latent heat in vapour, and specific caloric of air, that the latent caloric, given out into air by the vapour which condenses into cloud, expands the air in the cloud about 8000 cubic feet for every cubic foot of water generated in the cloud; and it is known, that it requires about 1300 cubic feet of vapour in the air to make one cubic foot of water. The difference between these quantities, or 6700 cubic feet, is therefore the actual expansion for every cubic foot of water generated from the condensing vapour. This great expansion of the air in a forming cloud, should evidently cause the air to spread out above, around the cloud, causing the barometer to rise around it, by the increased quantity of gravitating matter, and also causing the barometer to fall under the cloud, especially near the middle of the base of the ascending column, as it is known to do under great storm-clouds.

It was a remarkable fact, he said, in the history of science, that no one had adverted to a deduction from the laws of dynamics, which he deemed incontrovertible, that the wind must blow inwards on all sides of a storm, since the barometer is known always to stand low at the centre, sometimes more than two inches lower than the mean: and he went on to show that, in narrow spouts or tornadoes, where the friction of the air at the surface of the earth may be neglected, the air, following the law of spouting fluids, would spout upwards with a velocity of 240 feet per second, if the barometer should fall only one inch; and so in proportion to the square root of the fall.

Mr. Espy stated that experiments had been made, both in Great Britain and France, on dry air, similar to those which he had made with his nephelescope; but none, he believed, had ever been made with moist air, so as to compare the results together.

Finally, Mr. Espy gave a brief summary of the principles of his theory. When the air becomes heated or highly charged with vapour at the surface of the earth, it becomes lighter, and ascends in columns, comes under less pressure, expands, becomes colder by expansion, begins to condense its vapour into water or cloud, when it becomes as cold as the dew point; which it will do when it rises as many hundred yards as the dew point is below the temperature of the air in degrees of Fahr.; and the higher it goes the more vapour will it condense, the more latent heat will it give out, and the more will the cloud expand by the latent heat evolved. The more also will the barometer fall under the cloud: this will cause the air to rush towards the centre of the ascending column, where the barometer stands low: the air thus rushing in will ascend and form cloud as before, and thus the process will be continued as long as air continues to come in, highly charged with vapour. And as the storm-cloud moves over the surface of the earth, the air around is thus pressed in towards the centre of the region under the cloud, and upwards into the cloud, in consequence of the diminished specific gravity of the air.

The Committee of Finance presented the Treasurer's accounts, with their annual report thereon; and the appropriations for the service of the coming year were made, in accordance with the recommendation of the Committee.

On motion of Dr. Patterson, additional authority was conferred on the Committee appointed on the 9th of August last, to make leases, &c. of the Museum Building.

Special Meeting, Dec. 31.

Present, thirty-nine members.

Mr. Du Ponceau, President, in the Chair.

The President announced the death of the venerable Treasurer and Librarian of the Society, John Vaughan, Esquire, which took place on the morning of the 30th instant, at the age of 85 years, 11 months and 14 days; and laid before the Society the following minute of the proceedings of the Officers and Council on the occasion:—

"At a special meeting of the Officers and Council of the American Philosophical Society, held on the 30th of December, 1841, Mr. Du Ponceau, President of the Society in the chair; the death of Mr. Vaughan having been announced, the following minute and resolutions were adopted on motion of Mr. Kane:—

"The Officers and Council of the American Philosophical Society, affectionately mindful of the relations that have so long and intimately subsisted between them and their venerable associate, Mr. Vaughan, direct this memorial of their feeling towards him to be entered upon their minutes.

"They remember Mr. Vaughan as the patriarch representative of the Society, its oldest member, who had for more than fifty years been an officer at this Board. They can never forget his zeal for science in all its departments, his sympathy with scientific men, and his unlimited devotion to the interests and honour of this Institution. They have proved the warmth of his social affections, and the constancy of his friendship. They have seen his active, unwearied, yet discriminating benevolence, as it extended itself through every circle; rejoicing with the happy, cheering the distressed, counselling the friendless, and succouring the needy. Like the rest of this community, they have venerated the moral beauty of his daily life; and they feel, that even in his peaceful death, he has not ceased to be a

benefactor to the city in which he lived, bequeathing to it, as he has done, the rich legacy of his admirable example, and a memory without reproach.

"*Resolved*, That a Committee of the Officers and Council be appointed to make arrangements for the funeral.

"*Resolved*, That these proceedings be reported to the Society at its special meeting, to be held to-morrow evening."

"The President appointed Dr. Chapman and Prof. Bache, the Committee under the first resolution.

"FRANKLIN BACHE, *Sec'ry*."

Dr. Chapman then presented the following preamble and resolutions; which were adopted unanimously.

The American Philosophical Society entertains the deepest sense of the loss it has sustained, in the death of its venerable and beloved associate, John Vaughan. The oldest of its members, he was also among its most diligent, faithful and efficient. Long devoted to the furtherance of its objects, he failed not at the same time to conciliate the confidence and affection of all with whom he was connected, by the elevation and moral tone of his spirit, the purity of his disposition, and the amenity of his manners. A zealous promoter of science, he was actuated by the contemplation of its inherent excellence, and tendencies to benefit the great concerns of mankind, without a single aspiration after its honours, distinctions, or emoluments. Content to occupy in the Society stations of laborious usefulness, he continued to the last moment of life to render to it services of inestimable value, and was only diverted from the exclusive advancement of its prosperity by the claims of other institutions of learning, or of charity, or of benevolence; none of which were ever presented to him, without awakening his zeal, and enlisting a share of his active exertions in their behalf. Modest and unpresuming—disinterested, generous, social, and hospitable—beneficent, cordial, and sincere—it may truly be affirmed of him, that no one was more uniformly esteemed by a singularly extensive acquaintance; and no one certainly among us has contributed more largely to the cause of humanity in its several relations, or can bequeath to this Society and

Community a brighter example to venerate and to follow. With these impressions of the character and services of its deceased associate, the Society has resolved:—

1st. That the arrangements made by the Board of Officers and Council, be approved and confirmed.

2d. That the Hall of the Society be appropriated for the reception of Mr. Vaughan's body before interment, and that his family and friends be requested to assemble there, on the occasion of his obsequies.

3d. That the members of the Society will attend the funeral, as mourners.

4th. That a member be appointed to prepare the biography of Mr. Vaughan, for publication under the auspices of the Society.

5th. That the Society will cordially co-operate with other Societies of which he was a member, or individuals approving the design, in erecting a durable monument over his grave.

6th. That the members, individually, tender their affectionate condolence and sympathy to the relatives of Mr. Vaughan, on the occasion of their common bereavement; and that the Secretaries be charged with the duty of communicating a copy of these resolutions to William Vaughan, Esq. of London, the oldest representative of his family.

Alexander Dallas Bache, Esq. one of the Secretaries, was appointed under the fourth resolution, to prepare Mr. Vaughan's Biography.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. JAN., FEB., MAR. & APRIL, 1842. No. 21.

Stated Meeting, January 7.

Present, twenty members.

Dr. PATTERSON, Vice-President, in the Chair.

The judges of the annual election, held this day, reported that the following officers had been chosen for the present year:—

President.

Peter S. Du Ponceau, LL. D.

Vice-Presidents.

Nathaniel Chapman, M.D.,
Joseph Hopkinson, LL. D.,
Robert M. Patterson, M.D.

Secretaries.

Franklin Bache, M.D.,
John K. Kane,
Alexander Dallas Bache, LL. D.,
Robley Dunglison, M.D.

Counsellors for Three Years.

Clement C. Biddle, LL. D.,
William Short,
Joseph Henry, LL. D.,
Philip H. Nicklin.

Curators.

Isaac Hays, M.D.,
Franklin Peale,
John P. Wetherill.

Treasurer.

George Ord.

Letters were read:—

From the Geological Society of London, dated 4th November, 1841,—the Society of Antiquaries of London, dated 19th Nov. and 3d Dec. 1841,—the Imperial Medico-Chirurgical Academy of Moscow, dated $^{1}/_{13}$th June, 1841,—and the Boston Society of Natural History, dated 2d June, 1841, acknowledging the receipt of copies of the Transactions and Proceedings of the Society:—

From the Institute of the Netherlands, dated 28th February, 1840, stating that duplicate copies of the sixth, seventh, eighth and ninth volumes of the Memoirs of the Institute had been forwarded to the Society:—

From Mr. William Vaughan, of London, addressed to Mr. John Vaughan, relating to documents received from the Society:—

From Mr. Peter Force, of Washington, dated 28th Dec. 1841, stating that he had forwarded three volumes of the American Archives to the Society:—

From Mr. Du Ponceau, dated 6th Jan. 1842, inclosing letters from Mr. Alcott:—and

From Mr. Jacob Snider, Jun., dated 7th Jan. 1841, transmitting a copy of the will of the late John Vaughan, Esq.

The following donations were announced:

FOR THE LIBRARY.

Nieuwe Verhandelingen der Eerste Klasse van het Koninklijk Nederlandsche Instituut van Wetenschappen, Letterkunde en Schoone Kunsten. Seven Parts. 4to. Amsterdam, 1837–38–39–40.—*From the Institute of the Netherlands.*

Verhandeling over het Verschil Tusschen de Algemeene Grondkrachten der Natuur en de Levenskracht. Door C. G. Ontijd. 8vo. Amsterdam, 1840.—*From the Author.*

A Discourse in Commemoration of the Life and Character of the Hon. Nicholas Brown, delivered in the Chapel of Brown University, Nov. 3d, 1841. By Francis Wayland, D.D. 8vo. 1841. *From the Author.*

Bulletin de la Société Impériale des Naturalists de Moscou. Nos. 1 to 4 for 1840, and No. 1 for 1841. 8vo. Moscow.—*From the Society.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. No. 5. New Series. Philadelphia, 1842.—*From the Editor.*

The Committee, consisting of Mr. Lea, Mr. Taylor, and Mr. Vanuxem, to whom was referred the paper of Professors William B. Rogers and Henry D. Rogers, entitled "Observations on the Geology of the Western Peninsula of Upper Canada, and the Western part of Ohio," reported in favour of its publication in the Society's Transactions, which was ordered accordingly.

Major Bache made an oral communication in relation to a method which he had recently practised for obtaining the magnetic meridian.

He stated that the instrument used in the operation was a theodolite of the ordinary English construction, having eight inch plates, with double verniers, reading to fifteen seconds, and a needle, 3¾ inches in length, moving in a compass box graduated to degrees. The method consists in measuring two equal arcs with the needle, one on each side of the zero, and referring them to the graduation on the limb of the instrument; the line bisecting the sum of these, as shown by the same means, being assumed as the magnetic meridian. The advantages which this mode has over the ordinary one by a single reading of the needle, consist in the means afforded by the graduation on the limb of the instrument, for ascertaining the probable error in each single determination of the meridian; and for referring any number of sets of observations to a fixed graduated plate, by which a mean of a series may be obtained. The mode of operating is as follows: the theodolite being levelled, and the horizontal limb unclamped, the upper plate is moved by hand until the needle coincides nearly with the graduation at 45° on the compass box. The limb is then clamped, and the final movement made with the tangent screw; the observer placing himself for that purpose in range with the centre pin and given line on the compass box; the coincidence being considered satisfactory when the eye can no longer distinguish the end of the needle from the end of the line of the graduation. The reading on the limb is then made. The plates are now unclamped, and the upper one turned to bring the needle, as in the first instance, near the graduation at 45° on the other side of the zero; and the operation for obtaining a nice coincidence is performed, and the limb a

second time read. The line, bisecting the angle given by these two readings, is the magnetic meridian, as indicated by the needle of the instrument. To show the accuracy of which this method is susceptible, he mentioned that, on the occasion referred to, the angle of 90° was measured by the needle, on the first trial to within three minutes and thirty seconds, on the second to within two minutes; and that in no case afterwards did the error amount to one minute, and frequently it was less than thirty seconds. He expressed the opinion that any one accustomed to the use of instruments may obtain equally satisfactory results. In conclusion he deemed it proper to state that the theodolite used was made by Mr. Edward Draper, Mathematical Instrument Maker, of Philadelphia.

Dr. Hays announced the decease of Professor de Candolle, of Geneva, a member of the Society.

Mr. Kane informed the Society that the Secretaries had appointed Dr. Bache, Reporter, and Dr. Dunglison, Corresponding Secretary for the present year.

Mr. Lea, Chairman of the Publication Committee, laid upon the table the First Part of Volume VIII. of the Society's Transactions; and Mr. Kane, late Reporter, the closing Number for 1841 of the Proceedings.

Dr. Patterson, on behalf of the Committee on the Museum property, requested authority to memorialize the Legislature for a grant of the necessary powers, to enable the Society to make disposition of the Hall now occupied by it; which request, on motion, was granted.

On motion of Prof. A. D. Bache, the Curators were requested to receive the standards of measure, left by Mr. Vaughan to the Society, and to have them placed in suitable cases and deposited in the Cabinet.

Special Meeting, January 15.

Present, fourteen members.

Mr. Du Ponceau, President, in the Chair.

The President announced the death of Joseph Hopkinson, one of the Vice-Presidents, which occurred this day, in the

72d year of his age, and referred in impressive terms to the virtues and services by which his life has been illustrated; and thereupon, on motion of Dr. Patterson, the following minute and resolutions were unanimously adopted:—

The American Philosophical Society, after the lapse of a brief fortnight, finds itself again called upon to mourn over the loss of a valued officer and associate. The Honourable Joseph Hopkinson bore a name distinguished in the Society from the earliest period of its existence. His grandfather, Thomas Hopkinson, was selected, nearly a century ago, as the first President of one of the branches of which our Institution is composed; and his father, Francis Hopkinson, was afterwards one of its most zealous and influential members, and contributed ingenious papers to its Transactions. From these ancestors, our lamented Vice-President inherited an attachment to our Institution, which, during his long connection with it, he lost no opportunity of exhibiting, and for which we shall ever hold him in grateful remembrance. Possessed of talents of a high order, of great industry, and a conscientious sense of duty, he was enabled to act an important and distinguished part in life; and long will it be before his place can be filled in the community of which he was an ornament. After reaching the limit of life, with a mind unimpaired and an activity almost youthful, he passed tranquilly to its end, after a short illness unattended by the sense of pain. He lived as his friends wished that he should live, and he died as he himself always wished to die. Entertaining a high value for the character and services of its deceased associate, and sincere regret for his loss, the Society resolves,—

1. That the members will attend the funeral as mourners.

2. That a member be appointed to prepare a notice of the life and character of Judge Hopkinson.

3. That the members tender their sympathy and condolence to the family of the deceased, and that the Secretaries be instructed to communicate to them a copy of these proceedings.

Dr. Chapman was appointed under the second resolution, to prepare an obituary notice of Judge Hopkinson.

Stated Meeting, January 21.

Present, thirty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the National Institution of Washington, dated 15th Jan. 1842,—from the Albany Institute,—and from Mr. Rebello, dated Rio Janeiro, 25th Nov. 1841, acknowledging the receipt of the Society's Proceedings.

From Mr. E. C. Bridgman, dated Macao, 2d July, 1841, transmitting a copy of the second part of a Chinese Chrestomathy, of which he is the author:—and

From Mr. Jacob Snider, Jun., dated 21st Jan. 1842, presenting the cast from Chantrey's bust of William Vaughan, of London, owned by the late librarian of the Society.

The Society passed a vote of thanks to Mr. Snider for this donation.

The following donations were announced:—

FOR THE LIBRARY.

American Archives: Consisting of a Collection of Authentick Records, State Papers, Debates and Letters and other Notices of Publick Affairs, &c. Prepared and published under Authority of an Act of Congress. 3 Vols. Folio. Washington, 1837, 39–40. *From Mr. Peter Force.*

A Digest of the Ordinances of the Corporation of the City of Philadelphia, and of the Acts of Assembly relating thereto. 8vo. Philadelphia, 1841.—*From the City Councils.*

Journal of the Asiatic Society of Bengal: edited by the Secretary. Nos. 22 to 29, inclusive. 8vo. Calcutta, 1841.—*From the Society.*

O Auxiliador da Industria Nacional, &c. Vol. IX. Nos. 1 to 6, inclusive. 8vo. Rio de Janeiro, 1841.—*From Mr. J. S. Rebello.*

Objections to Mr. Redfield's Theory of Storms, with some Strictures upon his Reasoning. By Robert Hare, M.D. 8vo.—*From the Author.*

FOR THE CABINET.

Two specimens of preserved butterflies, from Malta. Accompanied by explanatory letters from the donor, and the Rev. Dr. Bethune.—*From Mr. William Winthrop Andrews, U. S. Consul, Malta.*

Dr. Hare made an oral communication, in which he pointed out what he conceived to be very glaring errors in Mr. Redfield's opinions, which may be briefly stated as follows:—

1st. That all atmospheric currents, whether designated as trade winds, gales, storms, tempests, tornadoes, thunder gusts or hurricanes, are to be explained by a reference to the "simple conditions of the great laws of gravitation;" the agency of electricity being neglected, and "the theory of *calorific rarefaction*" renounced.

2d. In alleging the existence of "*opposing and unequal forces*," without specifying their nature, or accounting for their existence; although implying that they are the effects of "*the simple conditions of the great laws of gravitation.*"

3d. In assigning to "*all fluid matter a tendency to run into whirls or circuits, when subjected to opposing and unequal forces;*" which can be true only in some peculiar cases of the influence of such forces.

4th. In treating of *all* storms as whirlwinds; or in other words in making the words storm and whirlwind synonymous, and yet representing a rotative movement in the air, or in other words a whirlwind, "*as the only known cause of violent and destructive winds or tempests;*" so that a whirlwind is the only cause of its own force!

5th. In averring that "*all narrow and violent vortices have a spiral involute motion, quickening in its gyrations as it approaches the centre or the axis of the whirl;*" whereas, it must be evident that, when a whirl is the consequence of forces applied at the periphery of any mass, the consequent velocity in any part of the mass will be less in proportion to its proximity to the axis; and that the only case in which it will be greater in proportion to the nearness of the axis, is where the motion proceeds from some competent cause acting at the centre.

6th. In admitting the gyration which he considers as the cause of storms, to quicken as it approaches the axis of motion, without perceiving that this characteristic is, as above stated, irreconcilable with

his fundamental doctrine that "*gyration, caused by opposing and unequal forces*," acting necessarily at points remote from the axis, is productive of all the phenomena in question.

7th. In representing a "*vortical*, or gyratory, *action*,"* for which no source is assigned, *unless* "*unequal and opposing forces*" resulting from "*the simple conditions of the great laws of gravitation*," as the proximate cause of the upward force of tornadoes; whereas, if such action be not the effect of an upward force, but is on the contrary a proximate cause of the phenomena, it could only have an influence the opposite of that suggested by Mr. Redfield, and which the facts require. Necessarily producing a centrifugal movement in the lower stratum of air, it would, by diminishing the pressure about the axis of the whirl, cause the upper air, beyond the theatre of the gyration, to descend in order to restore the equilibrium.

Dr. Hare made another oral communication respecting a new ethereal liquid which he had succeeded in obtaining.

He mentioned that he had procured by means of hyponitrite of soda, diluted sulphuric acid, and pyroxylic spirit, an ethereal liquid in which methyl (C_2 H_3) might be inferred to perform the same part as ethyl (C_4 H_5) in hyponitrous ether. In fact, by substituting pyroxylic spirit for alcohol, this new ether was elaborated by the process for hyponitrous ether, of which he had published an account in the Society's Transactions, Vol. VII., Part 2.

The compound which was the subject of his communication, had a great resemblance to alcoholic hyponitrous ether, similarly evolved, in colour, smell and taste; although there was still a difference sufficient to prevent the one from being mistaken for the other.

Pyroxylic spirit appeared to have a greater disposition than alcohol to combine with the ether generated from it, probably in consequence of its having less affinity for water. The boiling point appeared to be nearly the same in both of the ethers; and in both, in consequence of the escape of an ethereal gas, an effervescence, resembling that of ebullition, was observed to take place at a lower temperature than that at which the boiling point became stationary. The ethereal gas, of which Dr. Hare had given an account in his communication respecting hyponitrous ether, seemed to have escaped the attention of European chemists; and, even after it had been noticed by him,

* See American Journal of Science, Vol. XXXVI. No. 1.

seemed to be overlooked by Liebig, Kane, and others in their subsequent publications.

Dr. Hare attached the more importance to his success in producing the ether which was the subject of his communication; since, agreeably to Liebig, no such compound exists, and it is to be inferred that efforts to produce it had heretofore failed. It was presumed that this would excite no surprise, when the difference was considered between the consequences of the reaction of nitric acid with pyroxylic spirit, and with alcohol.

The liquid last mentioned is now viewed as a hydrated oxide of ethyl, while pyroxylic spirit is viewed as a hydrated oxide of methyl. When alcohol is presented to nitric acid, a reciprocal decomposition ensues. The acid loses two atoms of oxygen, which by taking two atoms of hydrogen from a portion of the alcohol, transforms it into aldehyd; while the hyponitrous acid, resulting inevitably from the partial deoxydizement of the nitric acid, unites with the base of the remaining part of the alcohol. But when pyroxylic spirit is presented to nitric acid, this acid, without decomposition, combines with methyl, the base of this hydrate; so that, as no hyponitrous acid can be evolved, no hyponitrite can be produced. Thus in the case of the one there can be no ethereal hyponitrite, in that of the other, no ethereal nitrate.

Dr. Hare regretted that Liebig should not have been informed of the improved process for hyponitrous ether, to which he had referred in commencing his communication. Instead of recommending a resort to that process, it was advised that the fumes, resulting from the reaction of nitric acid with fecula, should be passed into alcohol, and the resulting vapour condensed by means of a tube surrounded by a freezing mixture.

This process Dr. Hare had repeated, and found the product very inferior in quantity and purity to that resulting from the employment of a hyponitrite. In this process, nascent hyponitrous acid, as liberated from a base, is brought into contact with the hydrated oxide. In the process recommended by Liebig, evidently this contact could not take place; since it was well known that hyponitrous acid could not be obtained by subjecting fecula and nitric acid to distillation, and condensing the aëriform products.*

* The process alluded to is as follows:—Seven parts of acid, eight parts of alcohol, fourteen parts of water, and fourteen of hyponitrite being prepared, add seven parts of water to the salt and seven to the acid, and allow the mixture to cool. The saline solution and alcohol are introduced into a tubulated

Professor A. D. Bache communicated, on behalf of Mr. Nicollet, of Washington, an abstract of observations on the magnetic dip, made at Baltimore, Washington, Philadelphia, Albany, Oswego, Niagara Falls, Detroit, Mackinaw Island, Chicago, Joliet, Ottawa, Peru, Illinoistown and St. Louis. He also read a letter from Major Sabine, communicating the progress of the general series of magnetic observations; and one from Prof. Loomis, of Western Reserve College, stating that, last autumn, he had made observations of the magnetic dip at nearly forty different stations, in the north-west part of the United States, the results of which he intended hereafter to communicate to the Society.

Dr. Goddard showed specimens of photographic portraits made by the diffused light of a room, and by a peculiar process in which bibromide of iodine is used. This process he described, and stated that he had ascertained only to-day, that a similar method had been presented to the French Academy, which, however, in some particulars, was inferior to his own.

Mr. George Ord was elected Librarian, in the place of John Vaughan, deceased.

The following standing Committees were appointed for the present year.

Of Finance.—Mr. C. C. Biddle, Dr. Patterson, and Mr. Nicklin.

Of Publication.—Mr. Lea, Dr. Hays, and Mr. Fisher.

On the Hall.—Mr. Campbell, Mr. Richards, and Mr. G. W. Smith.

retort, of which the recurved and tapering beak enters a tube, which occupies the axis and descends through the neck of an inverted bell-glass, so as to terminate within a tall phial. Both the tube and phial must be surrounded by ice and water. The diluted acid is then added gradually. A water-bath, blood-warm, is sufficient to cause all the ether to come over.

Agreeably to another plan, the materials, previously refrigerated by ice, are introduced into a bottle, also similarly refrigerated. Under these circumstances the ether soon forms a superstratum which may be separated by decantation.

This last mentioned process does not answer so well for the hyponitrite of methyl, on account of the pyroxylic spirit being prone to rise with the ether. Yet, the spirit may be separated from the ether by anhydrous chloride of calcium.

On the Library.—Dr. Hays, Mr. Campbell, and Mr. Penington.

Agreeably to the laws, the list of surviving members was read; by which it appeared that the number of members, at the beginning of the year was 329; namely, 228 resident in the United States, and 101 in foreign countries.

The following gentlemen were elected members of the Society:—

Alexis de Tocqueville, of Paris.
Baron de Roenne, of Prussia.
John F. Frazer, of Philadelphia.
E. Otis Kendall, of Philadelphia.
Charles Lyell, of London.
J. N. Nicollet, of Washington.
Baron de la Doucette, of Paris.
E. W. Brayley, of London.

Stated Meeting, February 4.

Present, thirty-one members.

Mr. Du Ponceau, President, in the Chair.

Professors Frazer and Kendall, members elect, were presented to the President and signed the Laws.

Letters were read,—

From Baron Roenne, dated 29th January, 1842,—from Mr. Charles Lyell, dated 5th Feb. 1842,—and from Mr. J. N. Nicollet, dated 1st Feb. 1842, severally acknowledging the honour of their election as members of the Society:—

From the Geological Society of London, dated 21st Oct. 1841,—the Society of Arts of London, dated 27th Nov. 1841, and from the Royal Asiatic Society of London, dated 6th Nov. 1841, severally acknowledging the receipt of copies of the Society's Transactions:—

From Dr. Tidyman, of Charleston, dated 10th Jan. 1842, transmitting four volumes of the Statutes of South Carolina, as a donation:—and

From M. de Bacourt, Minister of France, dated Washington, 2d Feb. 1842, stating that the missing numbers of the Archives du Museum d'Histoire Naturelle would be forwarded to the Society.

Three letters were read from Mr. Jacob Snider, Jun.; the first, communicating an extract from a letter from Mr. William Vaughan, of London, dated 3d Jan. 1842, relating to the receipt of the Society's Proceedings, &c. for distribution; the second, dated 4th Feb. 1842, relating to parcels received for the Society, and papers from Mr. Murray, printed on the Franklin Press; and the third, dated 4th Feb. 1842, making certain donations to the Society, and assuming the payment of the collateral inheritance tax on the bequests of Mr. John Vaughan.

On motion, it was resolved that the thanks of the Society be returned to Jacob Snider, Jun. Esq., for his liberal donations, made this evening.

The following donations were announced:—

FOR THE LIBRARY.

Annales des Mines. Vol. XIX. Parts 1, 2 & 3 for 1841. Paris, 1841.—*From the Engineers of Mines.*

Journal Asiatique. For June, July, & August, 1841. Three Numbers. Paris, 1841.

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series Vol. I. No. 6. Philadelphia, 1841.—*From the Editor.*

Bulletin de la Société de Geographie. Second Series. Vol. XV. 8vo. Paris, 1841.—*From the Society.*

The Statutes at Large of South Carolina. Edited by David J. M'Cord. Vols. VII, VIII, IX. & X. 8vo. Columbia, S. C. 1840-41.—*From Dr. Philip Tidyman.*

The Practice of Medicine; or a Treatise on Special Pathology and Therapeutics. By Robley Dunglison, M.D. Two Volumes, 8vo. Philadelphia, 1842.—*From the Author.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais. No. 22. Valencia, 1841.—*From the Society.*

Journal of the Royal Geographical Society of London. Vol. XI. Part 1. 8vo. London, 1841.—*From the Society.*

Transactions of the Cambridge Philosophical Society. Vol. VII. Part 2. 4to. Cambridge, 1841.—*From the Society.*

Mémoire sur Différens Procédés d'Intégration, .&c. &c. Par J. Plana. Extrait du Journal des Mathematiques de M. Crelle.—*From the Author.*

Proceedings of the Zoological Society of London. Part VIII. 8vo. London, 1840.—*From the Society.*

Supplemental Instructions for the use of the Magnetical Observatories. 8vo. London, 1841.—*From the Royal Astronomical Society.*

The British Almanac of the Society for the Diffusion of Useful Knowledge for the Year 1842. 12mo. London, 1842.—*From Mr. Jacob Snider, Jun.*

Memorias de la Sociedad Patriotica de la Habana. Vol. XIII. No. 73. Havana, 1841.—*From Dr. Dunglison.*

Chinese Chrestomathy, in the Canton Dialect. By E. C. Bridgman. 4to. Macao, 1841.—*From the Author.*

A note to the paper of Dr. Harlan, reported for publication at the last meeting, was read, and, by request of the Committee to whom the paper had been referred, was ordered for publication.

Dr. Hare made an oral communication in relation to the report presented to the Academy of Paris on Mr. Espy's theory of tornadoes, rain, &c., and stated that, on his representations that the electrical theory of these meteors had not been duly considered in making up the report, the subject had been again brought before the Academy and referred.

Prof. A. D. Bache made some statements, on the authority of Mr. Espy, of the circumstances under which the conclusions to the report referred to had been prepared.

Dr. Hare also communicated some observations on the suspension of clouds, made by him last summer in Switzerland, and stated his opinion that clouds were constantly forming and dissolving masses of vapour.

Mr. Lea made some remarks upon the Oolitic formation of America, and submitted evidence of its existence, in addition to that furnished in his paper, published in the Society's Transactions.

Dr. Dunglison, on behalf of Dr. Cohen, of Baltimore, communicated a paper, describing the post mortem appearances in a case of deafness.

In this case, an abnormous state of the ossicles and other irregularities were found in one ear; and destruction of the membrana tympani and disorganization of the soft parts of the tympanum, &c., in the other.

Stated Meeting, February 18.

Present, thirty-two members.

Mr. Duponceau, President, in the Chair.

Mr. Lyell, of London, a recently elected member, was presented to the President and signed the Laws.

Letters were read:—

From the Royal Society of Göttingen, dated 18th August, 1841, acknowledging the receipt of copies of the Transactions and Proceedings of this Society, and notifying it of the transmission of the eighth volume of the "Commentationes Societatis Regiæ Scientiarum Gottingensis Recentiores:"—

From the Historical Society of Pennsylvania, inviting the members of this Society to be present at the delivery of a discourse by Job R. Tyson, Esq., before the former Society, on the evening of the 21st instant:—and

From Mr. Adam Ramage, offering to put the Franklin Press in order at his own expense, in order that the members might have an opportunity of pulling a sheet on it.

The invitation of the Historical Society was accepted, and the letter of Mr. Ramage referred to a committee, with power to take order.

The following donations were announced:—

FOR THE LIBRARY.

A Monograph of the Limniades, or Fresh-water Univalve Shells of North America. By S. S. Haldeman. No. 4. 8vo. Philadelphia, 1842.—*From the Author.*

An Account of the Receipts and Expenditures of the United States for the Year 1840. Prepared in the Office of the Register of the

Treasury. 8vo. Washington, 1842.—*From the Treasury Department.*

Document No. 70, Second Session, Twenty-seventh Congress. North-eastern Boundary.—*From Major J. D. Graham.*

FOR THE CABINET.

Twenty-one Copper Coins, chiefly Oriental.—*From Dr. Diver.*

A Fossil from the Island of Antigua.—*From Mr. G. M. Justice.*

Mr. Justice referred to certain interesting documents, relating to the history of Pennsylvania, which he hoped hereafter to be able to lay before the Society. He noticed particularly those relating to the expenses incurred in running Mason and Dixon's Line.

Mr. Kane informed the Society that the Legislature had recently passed an act, agreeably to the memorial of the Society, granting the power of selling the Hall.

Stated Meeting, March 4.

Present, thirty-four members.

Mr. Du Ponceau, President, in the Chair.

The following donations were announced:—

FOR THE LIBRARY.

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia, Vol. I. No. 1. 8vo. Philadelphia, 1841.—*From the College.*

A New Dictionary of Medical Science. Third Edition, greatly modified and enlarged. By R. Dunglison, M.D. Philadelphia, 1842.—*From the Author.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven, M.D. en W. H. de Vriese, M.D. 8vo. Leyden, 1841.—*From the Editors.*

The Committee, consisting of Mr. Walker, Dr. Patterson, and Major Bache, to whom were referred Mr. Simeon Bor-

den's additional papers relative to the Trigonometrical Survey of Massachusetts, reported in favour of their publication in the Society's Transactions, which was ordered accordingly.

Prof. Vethake announced the death of Philip H. Nicklin, one of the Counsellors of the Society, which occurred on the 2d of March, at the age of 55; accompanying the announcement with appropriate remarks in relation to the character and services of the deceased: whereupon the Society appointed Prof. Vethake to prepare a necrological notice of Mr. Nicklin.

A communication was presented by Prof. A. D. Bache, on behalf of Lieut. J. M. Gilliss, U. S. N., exhibiting the monthly means of the magnetic declination, the barometer, and the thermometer, as observed by him at the Washington Observatory. This communication was referred to a committee.

Mr. Lea stated that specimens of the Melania Altilis, described by him, and supposed hitherto to be a southern shell, had recently been found by his son on the shore of the Schuylkill, near this city.

Dr. Goddard presented specimens of Daguerreotypes on a surface of gilded silver, and stated that the surface of iodide of gold was more susceptible to the Daguerreotype action of light than that of the iodide of silver, that the surface of the plate might be polished without injury before the action of the iodine, and that the lights came out better than on the silver surface.

Major Bache remarked upon a theory presented by certain geologists, that the coral reef owes its permanence to vital forces, stating his conviction that this was rather owing to a general law by which vertical dikes, based below the depth of the action of the waves, opposed no resistance to their motion, and were not, therefore, destroyed. He stated that this fact had been observed by engineers, and used in most of our public works on the lakes, and that he had drawn a similar inference from observations made by him at Mount Desert Island in 1822.

Prof. A. D. Bache exhibited the curves representing the results of the bi-hourly magnetic observations, made during the years 1840 and 1841 at the Girard College Observatory, showing the daily changes of magnetic declination, and horizontal and vertical intensity. He stated that from these curves the

approximate times of maximum and minimum could be inferred; but that, in order to render the determination of the periods of their occurrence more accurate, additional observations at every six minutes were now made (since January 1) within the limits shown by the curves, presented this evening, to be those of the occurrence of maxima and minima.

The Committee on the Hall reported that the articles bequeathed to the Society by the late Mr. Vaughan, as well as those presented by Mr. Jacob Snider, Jun., were now in its possession.

Stated Meeting, March 18.

Present, twenty-seven members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Royal Academy of Sciences of Berlin, dated 15th Aug. 1841, acknowledging the receipt of the Transactions and Proceedings of the Society, and of the American Almanac for 1841; and notifying the transmission of their Transactions for 1839, and their Monthly Reports from July, 1840, to June, 1841:—and

From the Royal Academy of Sciences of Brussels, dated 18th Aug. 1841, acknowledging the receipt of copies of the Society's Transactions and Proceedings.

The following donations were announced:—

FOR THE LIBRARY.

A Catalogue of Books. Henry G. Bohn, York Street, Covent Garden. 8vo. of 1948 pages. London, 1841.—*From Mr. Henry G. Bohn.*

Zoological Contributions. On some American Species of Hydrachnidæ. By S. S. Haldeman. No. 1. 8vo. 1842.—*From the Author.*

Boston Journal of Natural History. Vol. IV. No. 1. 8vo. Boston, 1842.—*From the Boston Society of Natural History.*

Notice of the Origin, Progress, and present Condition of the Boston Society of Natural History.—*From the Society.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 7. Philadelphia, 1842.—*From the Editor.*

Nouveaux Mémoires de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Vol. XIV. 4to. Brussels, 1841.—*From the Academy.*

Mémoires Couronnés par l'Académie Royale des Sciences et Belles Lettres de Bruxelles. Vol. XV. Part 1. 4to. Brussels, 1840–41.—*From the same.*

Bulletin de l'Académie Royale de Bruxelles. Vol. VIII. Nos. 7, 8 & 9. 8vo. Brussels, 1841.—*From the same.*

Royaume de Belgique. Ministère de l'Intérieur. Statuts Organiques de la Commission Centrale de Statistique. 8vo. Brussels, 1841. *From the Minister of the Interior.*

Du Spiritualisme au XIXme Siècle, ou Examen de la Doctrine de Maine de Biran. Par L. A. Gruyer. 8vo. Brussels.—*From the Author.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. X. No. 10. Philadelphia, 1842.—*From the Academy.*

Commentationes Societatis Regiæ Scientiarum Gottingensis Recentiores. Vol. VIII. 4to. Göttingen. 1841.—*From the Society.*

Abhandlungen der Königlichen Akademie der Wissenschaften zu Berlin. Aus dem Jahre 1839. 4to. Berlin, 1841.—*From the Academy.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Preuss. Akademie der Wissenschaften zu Berlin, in den Monatem Julius, Aug. Sept. Oct. Nov. & Dec. 1840, & Januar, Februar, März, April, Mai, & Juni, 1841.—*From the Academy.*

Versuche zur Bestimmung der Elasticität und Festigkeit verschieder, auf Königlich Hannoverschen Eisenhütten verfertiger Stabeisen-Sorten. Aus den Acten mitgetheilt von I. F. L. Haussmann.—*From the Author.*

Thermometrical Observations as connected with Navigation. By James Mease, M.D. 8vo. Philadelphia, 1841.—*From the Author.*

A donation for the library was also received from Mr. Jacob Snider, Jun., consisting of 118 works, comprised in 230

volumes, formerly the property of the late John Vaughan, Esq., having formed part of his library prior to the year 1798. The donation was accompanied by a letter from the donor, and an accurate catalogue of the books.

For this valuable donation, the Society passed a special vote of thanks to Mr. Snider.

The following is a list of the books comprised in Mr. Snider's donation.

Jeffrey's West India Atlas. Folio. *London*, 1783.

Carey's General Atlas. Folio. *Philadelphia*, 1795.

Forty Accurate Plans on a large Scale of Ports, &c. in the West Indies. Folio. *London*, 1790.

Dictionnaire Universel, vulgairement appelé Dictionnaire de Trévoux. 8 Vols. Folio. *Paris*, 1771.

Historical and Chronological Deduction of the Origin of the Commerce of the British Empire. 2 Vols. Folio. *London*, 1764.

Nievhoff's Account of Goyer and Keyser's Embassy to China, &c. Folio. *London*, 1673.

Shaw's Travels in Barbary and the Levant. Folio. *Oxford*, 1738.

Virloy. Dictionnaire d'Architecture, Civile, Militaire, et Navale. 3 Vols. 4to. *Paris*, 1770.

Saint Méry. Description Topographique, Physique, Civile, Politique et Historique de la Partie Française de l'Isle de St. Domingue. 2 Vols. 4to. *Philadelphia*, 1797.

Historical and Chronological Deduction of the Origin of Commerce, from the earliest Accounts. 4 Vols. 4to. *London*, 1787.

De Laulnais. Guide de Commerce. Folio. *Paris.*

De la Loubere's New Historical Relation of the Kingdom of Siam. Folio. *London*, 1693.

Della Storia di Genova dal Trattato di Worms fino alla Pace d'Aquisgrana. 4to. *Leida*, 1750.

Tavernier's Collection of Travels through Turkey into Persia and the East Indies. Folio. *London*, 1684.

Histoire Générale de la Chine, ou Annals de cet Empire. 12 Vols. 4to. *Paris*, 1777.

Guthrie's New System of Geography. Second Volume. 4to. *Philadelphia*, 1795.

Gaigneur. Le Pilote Instruit, ou Nouvelles Leçons de Navigation. 4to. *Nantes*, 1781.

Bouguer. Traité du Navire, de sa Construction, et de ses Mouvements. 4to. *Paris*, 1746.

Jones' English System of Book-keeping. 4to. *New York*, 1797.

Jeffreys' Voyages from Asia to America, for completing the Discoveries of the N. W. Coast of America. 4to. *London*, 1764.

Juan et Levêque. Examen Maritime, théorique et pratique, ou Traité de Méchanique. 2 Vols. 4to. *Nantes*, 1783.

Secret History of the Armed Neutrality. 12mo. *London*, 1792.

Rush's Account of the Yellow Fever. 8vo. *Philadelphia*, 1794.

Poyvre. Observations sur les Mœurs et les Arts des Peuples de l'Afrique, de l'Asie et de l'Amerique. 12mo. *Maestrich*, 1779.

Le Politique Indien, ou Considerations sur les Colonies des Indes Orientales. 12mo. *Amsterdam*, 1768.

Hardie's American Remembrancer. 12mo. *Philadelphia*, 1795.

Walker's Treatise on Magnetism, &c. 8vo. *London*, 1794.

Volney. Ruines, ou Meditations sur les Revolutions des Empires. 8vo. 1792.

The Federalist: a Collection of Essays written in favour of the New Constitution. First Volume. 12mo. *New York*, 1788.

New and Old Principles of Trade. 8vo. *London*, 1788.

Marius' Advice concerning Bills of Exchange. 12mo. *Philadelphia*, 1790.

Lescallier. Traité pratique du Gréement des Vaisseaux, &c. 4to. *Paris*, 1791.

Memoirs of the American Academy of Arts and Sciences. First Volume. 4to. *Boston*, 1785.

Phillips' General History of Inland Navigation, Foreign and Domestic. 4to. *London*, 1791.

Voyage de l'Ambassade de la Compagnie des Indes, &c. 4to. *Philadelphia*, 1797.

An Inquiry into the Principles of Taxation. 4to. *London*, 1790.

Bouguer. De la Manoeuvre des Vaisseaux. 4to. *Paris*, 1757.

Du Monceau. Traité de la Fabrique des Manoeuvres pour les Vaisseaux, à l'Art de la Corderie perfectionné. 4to. *Paris*, 1769.

Guthrie's New Geographical, Historical, and Commercial Grammar. 8vo. *London*, 1788.

Girandeau. La Banque rendue facile aux Principales Nations de l'Europe. 4to. *Lyons*, 1769.

Robertson's Elements of Navigation. 2 Vols. 8vo. *London*, 1772.

Lelandi. Antiquarii de Rebus Britannicis. 6 Vols. 8vo. *London*, 1774.

Raynal. Histoire Philosophique et Politique des Etablissemens des Européens dans les deux Indes. 10 Vols. *Geneva*, 1786.

Le Spectacle de la Nature, ou Entretiens sur les Particularités de l'Histoire Naturelle. 8 Vols. 12mo. *Paris*, 1771.

Histoire Civile et Naturelle du Royaume de Siam. 2 Vols. 12mo. *Paris*, 1771.

Saint Méry's Topographical and Political Description of the Spanish Part of St. Domingo. 2 Vols. 8vo. *Philadelphia*, 1796.

Volney. Voyage en Syrie et en Égypte. 2 Vols. 1792.

Charleton's Three Tracts on Bath Water. 8vo. *Bath*, 1774.

History and Memoirs of the Royal Academy of Sciences at Paris. Fourteenth Volume. *London*, 1742.

Laws of the State of New York. 2 Vols. 8vo. *New York*, 1792.

Baddam's Memoirs of the Royal Society. 10 Vols. *London*, 1741.

Morse's American Geography. 8vo. *Elizabethtown*, 1789.

Haye's Negotiator's Magazine, or most Authentic Account of Moneys, &c. 8vo. *London*, 1740.

Sullivan's History of Maine. 8vo. *Boston*, 1795.

Fourcroy's Elements of Natural History and Chemistry. Second, third, fourth and fifth Volumes. 8vo. *London*, 1788.

Acts of the First Congress of the United States. 2 Vols. 8vo. *Philadelphia*, 1793.

Adams' Defence of Constitutions, &c. 3 Vols. 8vo. *London*, 1787.

Burgh's Political Disquisitions. 3 Vols. 8vo. *Philadelphia*, 1775.

Leach's Treatise of Universal Inland Navigation. 8vo. *London*, 1791.

Cooper's Information respecting America. 8vo. *London*, 1794.

Dictionnaire Dramatique. First & third Volumes. 8vo. *Paris*, 1776.

Nugent's Life of Cellini. 2 Vols. 8vo. *London*, 1771.

Wright's American Negotiator. 8vo. *London*, 1761.

Quincy's Lexicon. 8vo. *London*, 1775.

Imlay's Topographical Description of the Western Territory of North America. 8vo. *London*, 1793.

Life of Pyrrhus. 8vo. *London*, 1751.

Macquer's Elements of Chemistry. 2 Vols. 8vo. *London*, 1775.

Nicholson's Introduction to Natural Philosophy. 2 Vols. 8vo. *Philadelphia*, 1788.

The American Annual Register for 1796. 8vo. *Philadelphia*, 1797.

Letters of Sir Thomas Fitzosborne. 8vo. *London*, 1776.

Bossu. Nouveaux Voyages, &c. 8vo. *Amsterdam*, 1777.

Ramsay's History of the American Revolution. First Volume. 8vo. *Philadelphia*, 1789.

Transactions of the College of Physicians of Philadelphia. First Volume. 8vo. *Philadelphia*, 1793.

Letters on the Concert of Princes. 8vo. *London*, 1793.

Aldridge's Universal Merchant. 8vo. *Philadelphia*, 1797.

Le Commerce de la Hollande. First Volume. 12mo. *Amsterdam*, 1768.

Natural and Civil History of California. 2 Vols. 8vo. *London*, 1759.

Abrégé Portatif du Dictionnaire Geographique de la Martiniére. 12mo. *Paris*, 1759.

Dwight's Conquest of Canaan. 8vo. *Hartford*, 1785.

Gibson's Practical Surveying. 8vo. *Philadelphia*, 1789.

Middleton's Interest Book. 8vo. *London*, 1779.

Trabajos de Persiles y Sigismunda. Second Volume. 8vo. *Madrid*, 1781.

Restaut. Grammaire Française. 8vo. *Paris*, 1774.

Recherches Philosophiques sur les Americains, &c. 3 Vols. 12mo. *Berlin*, 1771.

Voyage de Gautier Schouten. 2 Vols. 8vo. *Rouen*, 1725.

Recueil des Voyages qui ont servi à l'Etablissement et aux Progrez de la Compagnie des Indes Orientales. 9 Vols. 8vo. *Rouen*, 1725.

Rolin. Abreviado ô Compendio de la Historia Antiqua. First, third, fourth, fifth and sixth Volumes. 8vo. *Amberes*, 1745.

Clendenin's Surveyor's Assistant. 4to. *Philadelphia*, 1793.

Les Caractères de Théophraste et de la Bruyere. 2 Vols. 12mo. *Paris*, 1769.

Adventures of Telemachus. First Volume. 8vo. *London*, 1778.

Bibliothèque Nouvelle d'un Homme de Gout. 4 Vols. 12mo. *Paris*, 1777.

Œuvres de Boileau Despreaux. 5 Vols. 8vo. *Amsterdam*, 1772.

Corinth's Address to Protestants. 8vo. *London*, 1772.

Œuvres de J. J. Rousseau. 12 Vols. (Second & eleventh Volumes wanting.) 12mo. *Amsterdam*, 1776.

Recherches Philosophiques sur les Égyptiens et les Chinois. 2 Vols. 12mo. *Berlin*, 1773.

Compendio de la Historia de España. 2 Vols. 12mo. *Madrid*, 1782.

Œuvres de Chaulieu. 2 Vols. 24mo. *Hague*, 1777.

Tableau de l'Histoire Moderne. Second & third Volumes. 12mo. *Paris*, 1772.

Bossuet. Discours sur l'Histoire Universelle. 2 Vols. *Paris*, 1775.

Contes Moraux. Second & fourth Volumes. 12mo. *Paris*, 1765.

Œuvres de Gresset. First Volume. 24mo. *London*, 1765.

Œuvres de Regnier. First Volume. 24mo. *London*, 1750.

Ambassades de la Compagnie Hollandoise des Indes d'Orient vers l'Empereur du Japon. 2 Vols. 12mo. *Leyden*, 1685.

Horace. Juvenal. Perseus. 12mo.

Biographical Dictionary. 24mo. *London*, 1794.

La Manière de bien penser dans les Ouvrages d'Esprit. 12mo. *Lyons.*

Henry Smetii Prosodia. 8vo. *London*, 1767.

Adelaide and Theodore, or Letters on Education. Second Volume. *London*, 1783.

The Rambler. Third Volume. *London*, 1784.

Watts' Psalms with Tunes. 8vo. *London*, 1722.

Compendium Grammaticæ Latinæ. 8vo. *Hamburg*, 1765.

United States' Register for 1795. 12mo. *Philadelphia*, 1794.

Reduction des Changes entre la France, l'Italie, l'Espagne, Hambourg, et la Hollande. 12mo. *Amsterdam*, 1767.

Cicero de Officiis. 8vo.

Grammatical Institutes, or an easy Introduction to Dr. Lowth's English Grammar. 12mo. *London*, 1793.

Abrégé des Principes de la Grammaire Française. 12mo. *Lusanne*, 1763.

Description of the Situation, Climate, Soil and Production in certain Tracts in Maine. 4to.

Italian, German, and French Grammar. 8vo. *Frankfort*, 1706.

A donation for the Cabinet was received from Dr. Harlan, consisting of a set of casts, comprising twenty-eight pieces, of a new fossil genus, named by him *Orycterotherium Missouriensis*, to be described in the forthcoming volume of the Society's Transactions.

On motion of Dr. Dunglison, the Society's Proceedings were directed to be regularly furnished to the Patriotic Society of Havana.

Stated Meeting, April 1.

Present, twenty-seven members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Geological Society of London, dated 2d Dec. 1841, and the Society of Arts of London, dated 23d Dec. 1841, acknowledging the receipt of No. 18 of the Society's Proceedings:—

From William Vaughan, Esq., of London, dated 2d March, 1842, in acknowledgment of the resolutions of the Society, passed in honour of his brother, the late Librarian:—

From the Editor of "L'Institut," dated Paris, 17th Jan. 1842, requesting that the Proceedings of the Society may be sent to him:—and

From Mr. Jacob Snider, Jr., in relation to the books recently given by him to the Society, and tendering a further donation of twenty-one volumes, provided the Society does not possess them already.

On motion of Prof. A. D. Bache, the Society directed a copy of the Proceedings to be regularly furnished to the Editor of "L'Institut."

The following donations were announced:—

FOR THE LIBRARY.

The History of the Herculean Straits; now called the Straits of Gibraltar. By Lieut. Col. Thomas James. 2 Vols. 4to. London, 1771.—*From Mr. Jacob Snider, Jr.*

Lectures on History and General Policy. By Joseph Priestley, LL.D. 4to. Birmingham, 1788.—*From the same.*

Travels during the Years 1787–88–89 in France. By Arthur Young, F.R.S. 4to. Bury St. Edmunds, 1792.—*From the same.*

Sheridan's Dictionary of the English Language. Revised and Corrected by John Andrews, D.D. 8vo. Philadelphia, 1789.—*From the same.*

An Historical Disquisition concerning the Knowledge which the Ancients had of India. By William Robertson, D.D. 8vo. Philadelphia, 1792.—*From the same.*

Tracts by Joseph Price, LL.D. 3 Vols. 8vo. London, 1783.—*From the same.*

Serious Considerations on the Political Conduct of Lord North. By Nathaniel Buckington, Esq. (Dr. Price.) 8vo. London, 1783.—*From the same.*

A Journey through Spain in the Years 1786–87. By Joseph Townsend. 3 Vols. 8vo. London, 1791.—*From the same.*

A New Portuguese Grammar. By Anthony Vieyra. 8vo. London, 1794.—*From the same.*

A Collection of French Comedies and Operas. 3 Vols. 8vo. Paris. Avignon.—*From the same.*

A Discourse of Coin and Coinage. By Rice Vaughan, Esq. 12mo. London, 1675.—*From the same.*

A Collection of Pamphlets.—*From the same.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. Vol. I. No. 8. 8vo. Philadelphia, Feb. 1842.—*From the Editor.*

Catalogue of the Library in Red Cross Street, Cripplegate. 2 Vols. 8vo. London, 1841. *From Mr. Petty Vaughan, through Mr. J. Snider, Jr.*

Proceedings of the Royal Astronomical Society of London. Vol. V. No. 18. 8vo. London, 1841.—*From the Society.*

Revista de España y del Estrangero. Director y Redactor Principal, D. Fermin Gonzalo Moron. Vol. I. No. 1. 8vo. Madrid, 1842.—*From the Editor.*

Boletin Enciclopedico de la Sociedad Economica de Valencia. Vol. I. No. 24. 8vo. Valencia, 1841.—*From the Society.*

Journal Asiatique. Troisième Série. Vol. XII. Nos. 67 & 68. 8vo. Paris, Sept. Oct. and Nov. 1841.—*From the Asiatic Society of Paris.*

Annals des Mines. Troisième Série. Vol. XX. No. 4. 8vo. Paris, 1841.—*From the Council of Mines.*

Chart of Cape Cod Harbour and the Adjacent Coast of Provincetown and Truro. Reduced from the Original of Major J. D. Graham, U. S. Topog. Eng., by J. W. Lewis, Civil Engineer. 1841.—*From Major Graham.*

Chart of Cape Cod Harbour and Adjacent Coast. Reduced from the Survey of Major J. D. Graham. Small size.—*From the same.*

Dr. Bache announced the death of Condy Raguet, Esq. a member of the Society, which took place on the 22d of March, at the age of 58; and on motion, Mr. C. C. Biddle was appointed to prepare an obituary notice of the deceased.

Prof. Kendall made an oral communication in relation to Encke's comet.

He stated that he had succeeded in finding the comet with the nine feet Fraunhofer equatorial of the High School Observatory, on the evenings of the 27th, 28th and 31st of March, and 1st of April; being the only clear evenings since the arrival of Prof. Encke's Ephemeris. The place of the comet in the Ephemeris, according to the observations made at the Observatory of the High School, is correct within 20″ of space. On the 27th, it appeared at first at 7, P. M., precisely in the centre of the field of view; the equatorial having been at sunset adjusted by the Ephemeris, and subjected to the motion of the clockwork. On all the evenings except the 31st, its position and distance from a known star or stars in the field, were measured by the Fraunhofer Filarmicrometer. On the 31st, this method was impracticable, and differences of right ascension and declination were observed and measured with reference to a star from Bessel's Zone Observations, preceding the comet by two minutes of time. The comet appeared as a conspicuous nebula, 32″ in diameter, condensed toward the centre, without nucleus and without tail, on the 27th and 28th; but on the 31st of March and 1st of April, it exhibited a faint tail, extending about 7′ of space, in position, 55° N. E. from the declination circle, and gradually widening towards the extremity. Prof. Kendall intended, while the comet remained visible, to continue his observations, and, when carefully reduced, to communicate them to the Society. He took occasion to acknowledge the assistance of Messrs. Patterson, Walker and Dick.

Dr. Hare related some experiments, showing that the vapour of nascent steam, generated by the hydro-oxygen flame, was not productive of electricity.

He observed that, before his late voyage to Europe, he had made some experiments in order to ascertain whether any electricity was given out by the flame of the hydro-oxygen blowpipe, or by the elements of water during their conversion into steam.

The unexpected electrical results, previously ascertained respecting high steam, naturally gave importance to this inquiry, the result of

which he had no previous opportunity of communicating to the Society.

Even the flame produced by means of a very powerful hydro-oxygen blowpipe, was not found to be productive of electrical indication, when allowed to act upon a metallic mass supported upon the canopy of an extremely delicate electroscope. As it was suggested that, the flame being a conductor, the electricity evolved might retrocede by it to the metallic pipe, the experiment was modified in the following way:—

The mixture of one part of oxygen and two of hydrogen, being, as in the first instance, condensed within a mercury bottle, was made, by means of a valve cock and safety tube, to communicate, through a glass tube, with a jet pipe of platinum, a foot in length and in bore.

The apparatus being thus arranged, and the cock so adjusted as to allow the gaseous mixture to escape through the jet pipe with sufficient celerity, a flame of hydrogen was applied to the outside of this pipe about the middle. By these means, the temperature being raised so as to cause the elements of water to combine, the flame was removed; the heat being sufficiently kept up by the internal combustion. Thus that which entered at one end of the tube as gas, came out at the other as steam. Under these circumstances, a single-leaf electrometer, more susceptible than a condensing electrometer, was not indicative of any electrical excitement, either in the insulated jet tube, or in any body on which the steam was allowed to condense.

Dr. J. K. Mitchell having expressed a wish to see these experiments, they were repeated, with his assistance, with the same results.

Dr. Hare also mentioned that he had observed an ethereal liquid to subside on the addition of pure pyroxylic spirit to an aqueous solution of hypochlorous acid, obtained by passing chlorine into water in contact with bioxide of mercury.

Having separated the ether thus produced, he found it to have an agreeable and peculiar fragrance. Like oil of wine, it could not be distilled without decomposition. There was an effervescence at the temperature of 140° F.; but the boiling point rose beyond that of a boiling water-bath. When a naked flame was applied, the ether, previously colourless, acquired a yellowish wine colour, and, by the crackling evolution of vapour, indicated decomposition.

When the liquid hypochlorous acid was subjected to the process of distillation, before the addition of the spirit, an ether resulted which

floated on the solution, and which appeared to differ from that obtained as first mentioned.

Dr. Hare made these observations, and those previously communicated respecting the hyponitrite of methyl, by the aid of a small quantity of pure pyroxylic spirit, supplied to him by his friend Dr. Ure, and regretted that both ill health and the exhaustion of his stock of spirit had prevented him from making further observations and experiments, tending to decide whether the ethers obtained, as he had described, were either or both hypochlorites, or whether mercury entered into the composition of the heavier ether. This there was some reason for believing; since, when boiled to dryness at a high temperature, a reddish residuum was apparent, which being redissolved, and a small strip of copper immersed in the resulting solution, a minute deposition, apparently metallic, was observable.

Dr. Dunglison drew the attention of the Society to the subject of a monument to Mr. Vaughan, on which resolutions had been passed on the occasion of Mr. Vaughan's death; whereupon, on motion of Dr. Chapman, a Committee was appointed to carry the resolutions into effect. Committee, Dr. Chapman, Dr. Dunglison and Mr. Kane.

Mr. Kane reminded the Society of its pledge to appropriate a certain sum of money for the Magnetic Observatory; whereupon, on motion of Dr. Chapman, it was resolved that the Committee, having charge of the subject, pay over the sum of one hundred and ninety dollars, now in their hands, for the use of the Magnetic Observatory.

Stated Meeting, April 15.

Present, thirty-seven members.

Mr. Du Ponceau, President, in the Chair.

A letter was read from the Corporation of the University of Cambridge, Mass., dated 11th April, 1842, acknowledging the receipt of Vol. VIII. Part 1, of the Society's Transactions.

A letter was also read from Isaac Elliott, Esq. addressed to Mr. Kane, enclosing an account against the Society for one

hundred and forty-three dollars, for services rendered by him, and generously offering the amount thereof to the acceptance of the Society. Whereupon, on motion of Dr. Patterson, the donation was accepted, and it was resolved unanimously, that the thanks of the Society be returned to Mr. Elliott for the same.

The following donations were announced:—

FOR THE LIBRARY.

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. New Series. No. 6. 8vo. Philadelphia, April, 1842.—*From the Editor.*

Whirlwind Storms; with a Reply to the Objections and Strictures of Dr. Hare. By W. C. Redfield. 8vo.—*From the Author.*

A New Key to the Exact Sciences. By F. Tillett. 8vo. 1824.—*From Professor Silliman.*

Catalogue of the Phenogamous Plants and Trees, growing, without Cultivation, within five miles of Yale College. 8vo. 1831.—*From the same.*

The Condition of the New Haven Burying Ground. 8vo. New Haven, 1839.—*From the same.*

An Essay on Matter. 8vo. Philadelphia, 1784.—*From the same.*

Twenty-Six Letters respecting the Revolution of America. Written in Holland in the year 1780. By John Adams. 12mo. New York, 1789.—*From the same.*

Sixth Geological Report to the General Assembly of Tennessee. Made October, 1841. By Gerard Troost, M.D. 8vo. Nashville, 1841.—*From the Author.*

Flora Batava, ou Figures et Descriptions de Plantes Belgiques. Par J. Kops et F. A. W. Miquel. Parts 123 & 124. 4to. Amsterdam, 1841.—*From his Majesty, the King of the Netherlands.*

Public Documents. No. 174. Second Session, Twenty-seventh Congress.—*From the Hon. G. W. Toland.*

On Regimen and Longevity. By John Bell, M.D. 8vo. Philadelphia, 1842.—*From the Author.*

Mr. G. W. Smith presented some Daguerreotype portraits, made by Mr. Cornelius by an improved process, an important part of which was the greater polish given to the plate, and the absence of cross lines.

Prof. A. D. Bache described the mode in which the self-registering rain gauge, by Osler, employed at the Magnetic Observatory at the Girard College, was adapted to registering the fall of snow.

He stated that in this climate, during winters of ordinary severity, if a record of the fall of snow were not kept on the same plan with that of the quantity of rain, a very considerable hiatus would be caused in a year's observations. In Osler's self-registering rain gauge, the water is conducted by a pipe from the funnel of the gauge to the reservoir in which it is weighed. To adapt this apparatus to register the rate of fall of snow, it is only necessary to keep the temperature of the funnel and connecting tube a little above that of the freezing point of water.

Prof. Bache further stated, that an arrangement for this purpose had been made under his direction, by Mr. S. W. Hall, Assistant at the Magnetic Observatory, which had proved completely successful. The funnel of the gauge was surrounded by a metallic casing, connected by a pipe, covered with a bad conductor of heat, to a small boiler, placed upon the stove which warmed the Observatory. The boiler being once supplied with water, the steam rising from it kept the funnel moderately warm; and being entirely condensed in the pipe and casing, the water returned to the boiler. If no leak occurred in the apparatus, no additional supply of water was necessary.

Mr. Walker communicated to the Society the principal points of Mr. Simeon Borden's Reply to the Criticism of Mr. F. R. Hassler, on the Massachusetts Survey, as reported upon in the Proceedings of the Society, Vol. II. No. 18, p. 59.

The criticisms of Mr. Hassler are alluded to in the Proceedings, No. 19, page 98, and may be briefly stated as follows:—

1. The phrase Chronometric Survey is inapplicable.
2. The Massachusetts Survey should have been stated to be begun in 1824 instead of 1831.
3. The Survey is incomplete till the soundings have been taken.
4. A sextant of 4 inches radius is unfit for use in a trigonometric survey.
5. The phrase *vertical triangles*, in No. 18, p. 60, at bottom, is improper.
6. Mr. Hassler objects to the mode of deducing the value of a degree of the meridian from differences of latitude, obtained by the use of a 4 inch sextant, in the table, page 61.
7. The rejection of the four results, stated on page 62, is considered by Mr. Hassler as discreditable to the work, being what is called "*cooking*."

8. Mr. Hassler is at a loss for the meaning of the words "arithmetical progression," in p. 62.
9. The method of obtaining the value of a degree, perpendicular to the meridian, by the convergency of the meridians, is objected to as being above the compass of the instruments in use by Mr. Borden, and as being too general in its conclusions, from a survey on so small a scale.
10. "Chronometric determinations," p. 62, are insufficient for the purpose of ascertaining the value of a degree perpendicular to the meridian.
11. Mountain attraction is not observable by the instruments used by Mr. Borden.
12. Mr. Hassler prefers the adoption of Bessel's elements of the spheroid, deduced from a discussion of all the trigonometric surveys yet made, instead of those derived from a survey on so small a scale, even with the best instruments.
13. Mr. Borden's ellipticity, 1-345, is adduced as confirming the 12th objection.
14. The latitude of Boston State House, p. 64, is uncertain, as having no other basis than sextant observations.
15. Are the altitudes, p. 65, single altitudes or series?
16. Mr. H. objects to the comparison of the *single* results in the table of latitudes, p. 65, and recommends the reduction of Mr. Paine's observations, (if they are used at all,) according to their situation and proximity to two points, at the greatest interval apart, or two points, situated so near the extremes of the survey as to receive all the observations with the least possible reduction, so as to obtain the most plausible ultimate mean for comparison with the trigonometric operations.
17. Mr. H. thinks that the discrepancies in p. 66, are sufficient ground for rejecting "chronometric determinations," and considers their inadequacy as an established point in Geodesy.
18. The actual topography is imperfect, the Township Surveys never having been completed with sufficient minuteness. Mr. H. also objects to the use of the "camera lucida" for purposes of topography.
19. The expense of the Massachusetts Survey should not have been stated—not being a subject of scientific interest.

Mr. Walker stated, on behalf of the Committee whose report on Messrs. Borden and Paine's labours had been made the subject of criticism by the Superintendent of the Coast Survey, that, previous to the drawing up of the report, a comparison had been made of Borden's spheroidal elements with Bessel's values, contained in the 333d No. of Schumacher's Astronomische Nachrichten; and that the agreement had been considered sufficiently close, to sanction the publication of Mr. Borden's results in their original state, as affording an illustration of the degree of success and precision attainable in a survey on a small scale like that of Massachusetts,—with instruments of small compass—conducted with great economy and despatch,—and finally reduced by spheroidal elements *indigenous* to the survey.

Mr. W. was by no means the advocate of cheapening science, or of the use of inferior instruments in the public service, nor would he have advised the choice of such instruments as were used in determining the latitudes and azimuths in

the Massachusetts Survey. He deemed it his duty, however, to say that the observers, Messrs. Borden and Paine, had made amends for the inferiority of their instruments by the application of extraordinary tact and skill, and had produced a survey adequate for all the purposes originally contemplated by the Legislature of Massachusetts. The discrepancies between the astronomical and topographical results in the tables referred to by Mr. Hassler, except for the stations of Pittsfield and Williamstown, are not much greater than those which the European surveys present. And the close agreement of the value of the degree perpendicular to the meridian, obtained by chronometric differences of longitude, with the most approved values of this element, shows that these instruments may be employed as an important auxiliary of a trigonometric survey. Indeed, from a comparison of the final results, for this small survey, (more extensive, however, than any other yet made, as far as regards the use of chronometers,) it must be manifest to any one that an extension of a similar comparison of chronometric and trigonometric results over the entire surface of the United States, besides furnishing all the requisites for topography, would form a valuable contribution to science, and perhaps go far to settle the question, how far the shape of the surface of this portion of the western continent conforms to the measures of the eastern. Mr. Borden had omitted no expedient for obviating the errors of the eccentricity of his repeating circle, and his complete success may be inferred from the fact that the sides of twenty miles length, derived from the original base by different series of triangles, conformed together within three feet on the average, and never differed more than five feet.

Mr. Walker stated that he differed in opinion from Mr. Hassler, in reference to the precision of the latitudes furnished from sextant observations by Mr. Paine. The 8½ inch sextant by Troughton was a choice instrument of its kind, and though absolute angles could not be measured by it without an error of perhaps 6″, yet, this error disappears, by observing, as in Mr. Paine's case, north and south stars of the same altitude on the same evening. There is not any necessary error outstanding, but that of the star catalogues. The others may vanish in the mean of a great number of observations. The same method was used with eastern and western altitudes for rating his chronometers; and being all executed by himself, there was no personal equation necessarily outstanding. It is to this compensation of small errors in the mean result that Messrs. Paine and Borden are indebted for the close agreement, (quite unexpected even by themselves,) of their spheroidal elements, derived from so small a survey, with the standard values of those elements derived from European triangulations. Mr. W. remarked that the publication of the statistics of the expense of the survey was useful to others, who contemplate similar undertakings, and had its example in the Transactions of other Academies.

Mr. W. then proceeded to notice Mr. Borden's answer to Mr. Hassler's objections to the Massachusetts Survey.

1. Any reader will understand the phrase "Chronometric Survey."
2. The Act of the Legislature ordering the Massachusetts Survey was passed in March, 1830.

3. The soundings are expected to be furnished by the Coast Survey.
4. The fine Troughton sextant used by Mr. Paine is 8½ inches in radius.
5. In computations relative to three-sided figures in the vertical, the phrase "*vertical triangles*" is not objectionable.
6. Will be answered in the sequel.
7. All the results are stated. Cooking, on the contrary, consists in suppressing unfavourable results, or altering the immediate data of instruments; not in rejecting results that differ too much from the mean.
8. Mr. B. refers to Mr. Hassler's Arithmetic, 8th edition, pages 127 and 128.
9. Mr. B. admits the difficulty of determining the value of a degree perpendicular to the meridian from the convergency of the meridians in low latitudes. He should not have adopted his result, had it differed much from that of the chronometers.
10. Mr. B refers to the tables of comparison.
11. Mr. B. finds the average discrepancy between Mr. Paine's and the trigonometric results to be only about 0*s*.4 in time, omitting Pittsfield and Williamstown, where they amount respectively to 2*s*.0 and 1*s*.3, and too far exceed the mean to be ascribed to errors of observation. They are also in the right direction to indicate an attraction of the plumb line towards the stations, which are on the west side of a mountain, 2000 feet high, and 20 miles broad.

12 & 13. Mr. B. refers to the results derived from the use of Bessel's elements of the spheroid, which do not exhibit any important discrepancy. Mr. Borden's elements, derived from the Massachusetts Survey, correspond with Bessel's almost as closely as it is possible to compare two scales together.

14 & 15. Mr. Borden refers to Mr. Paine's Report, from which it appears that the numbers on p. 65 refer to single readings.

16. Mr. Borden prefers the method used by himself; inasmuch as his results are obtained from the elements of the survey alone, without any "a priori" supposition respecting the dimensions of the spheroid, which Mr. Hassler's method requires.
17. Mr. B. leaves the chronometric comparisons to speak for themselves.
18. Mr. Borden admits that many of the Township Surveys were imperfect. The "camera lucida" was not used by Mr. B. for topographical purposes—had never before heard the instrument mentioned in connexion with topography.
19. The statement of the cost of the Survey was furnished by Mr. Borden, in answer to the inquiries of the Committee, and is derived from the documents on file in the Department of State.

Mr. Borden, having thus noticed Mr. Hassler's objections, proceeds to remark, that it was to him a source of regret that better instruments had not at first been procured by the State,—that they would have been productive of greater economy, dispatch and confidence in the precision of the results. His aim, however, had been to attain the greatest possible precision which the instruments permitted, and he had submitted the results to the Society as nearly in their original form as was possible in a brief notice. He could not but hope that the work would soon be further tested by the extension and progress of the Coast Survey.

Comparison of Bessel's elements of the spheroid, from the mean of ten surveys hitherto executed (See Astr. Nachr. No. 333), with those derived by Mr. Borden from his triangulation, combined with Mr. Paine's differences of latitude and longitude.

ELEMENTS.	Values from Bessel's Elements.	Borden's Values from the Massachusetts Survey.	Discrepancy.
Equatorial radius in English feet,	20922811.640	20914728.000	
,, ,, miles,	3962.653	3961.123	1.53
Semi-polar axis ,, feet,	20853232.370	20854128.000	
,, ,, miles,	3949.476	3949.646	0.17
Degree of meridian for middle latitude, 42° 21′ 30″ in feet.	364393.550	364356.000	37.55
Degree perpendicular to meridian, do.	365723.230	365511.330	212.10
Degree of the parallel, do.	270249.750	270092.120	157.63
Latitude of southernmost point, Nantucket,	41° 16′ 57″.02	41° 16′ 56″.62	0″.40
Latitude of northernmost point, Newburyport,	42° 48′ 31″.98	42° 48′ 32″.15	0″.17

The comparison of Mr. Paine's differences of longitude by chronometers, with those of the triangulation, reduced respectively by Bessel's and Borden's elements of the spheroid, gives the following results for the several stations, referred to the Boston State House.

No.	Station.	Paine, West of Borden, in time.	Borden, West of Bessel, in time.
		s.	*s*
1	Boston,	0.00	0.00
2	Amherst,	+ 0.49	+ 0.20
3	Barnstable,	+ 0.15	— 0.11
4	Cambridge,	+ 0 62	+ 0.01
5	Dedham,	— 0.67	+ 0.02
6	Greenfield,	+ 0.31	+ 0.21
7	Gloucester,	+ 0.13	— 0.05
8	Holmes' Hole,	+ 0.01	— 0.06
9	Lowell,	— 0.32	+ 0.03
10	Monomoy,	+ 0.61	— 0.15
11	Nantucket,	— 0.11	— 0.13
12	New Bedford,	+ 0.33	— 0.02
13	Newburyport,	+ 0.39	— 0.03
14	Northampton,	+ 0.40	+ 0.22
15	Pittsfield,	+ 1.93	+ 0.31
16	Plymouth,	+ 0.56	— 0.06
17	Providence,	+ 0.91	+ 0.05
18	Salem,	+ 0.24	— 0.02
19	Sandwich,	+ 0.92	— 0.08
20	Springfield,	+ 0.15	+ 0.21
21	Taunton,	+ 0.63	+ 0.00
22	Truro,	+ 0.89	— 0.14
23	Williamstown,	+ 1.28	+ 0.30
24	Worcester,	+ 0.19	— 0.10
25	Squam,	— 0.29	— 0.05
26	Thatcher's Island,	— 0.27	— 0.07
27	Eastern Point,	+ 0.13	— 0.05
28	Baker's Island,	+ 0.57	— 0.04

In consequence of the remark of Mr. Hassler, that differences of longitude, obtained by the transportation of chronometers, do not possess the requisite precision for determining the elements for the reduction of the triangulation, and are consequently unfit for geodetic purposes, Mr. Borden was induced to compare the results derived from all the chronometric differences of longitudes, with Bessel's mean result from the ten trigonometric surveys hitherto executed. For this purpose, having ascertained that the convergency of the meridians derived from the Massachusetts survey was sufficiently precise, since a change of + 2.″78 would fit them to Bessel's elements, he proceeds, through the medium of this convergency, to compute the value of the degree perpendicular to the meridian for the latitude of the State House, Boston, 42° 21′ 30″, by means of Mr. Paine's longitudes of those of the principal stations (Nantucket excepted) which were obtained directly from the State House, omitting intermediate stations not directly compared with the State House, and using relative weights proportionate to the polar angle.

No.	Stations compared.	Degree perpendicular to meridian in feet.	Relative weight.	Product in feet.
		D	W	D × W
1	Boston and Northampton,	365119	1.00	365119
2	,, Springfield,	365356	0.97	354395
3	,, Greenfield,	365198	0.98	357894
4	,, Worcester,	365904	0.47	171976
5	,, Barnstable,	365804	0.48	175586
6	,, Gloucester,	365991	0.25	91498
7	,, Monomoy,	366382	0.68	249140
8	,, Plymouth,	367653	0.25	91913
9	,, Truro,	366897	0.64	234814
10	,, Nantucket,	365329	0.62	226504
		Aggregate,	6.34	2318839
		Paine's mean value,		365747
		Bessel's do.		365723
		Discrepancy in feet,		24

By comparing one of the stations, viz. Nantucket, with New Bedford, with which it was actually compared by Mr. Paine, the tenth result becomes 364690, with a weight 0.52. This substituted for No. 10 in the table, gives the mean result, 365701, which falls below that of Bessel as much, nearly, as the former exceeds it, and is preferred by Mr. Borden.

The conclusion from this examination is, that chronometric comparisons do afford the means of determining one of the elements of the reduction of a trigonometric survey, viz. the value of a degree perpendicular to the meridian, and that, too, with a degree of uniformity quite too great to be the result of a happy accident.

Dr. Patterson, from the Committees severally appointed to negotiate for the sale of the Society's Hall and for the purchase of the Museum property, and to take charge of the new building, &c. presented reports from each Committee, the consideration of which was postponed to a special meeting, to be held on the 29th of April next.

The following gentlemen were elected members of the Society:—

Stephen Endlicher, of Vienna.

D. Humphreys Storer, M.D., of Boston.

Simeon Borden, of Boston.

Special Meeting, April 29.

Present, forty-four members.

Dr. Patterson, Vice-President, in the Chair.

The reports, postponed for consideration at this meeting, were taken up, and referred to a special Committee, to report to the Society thereon, and on the whole subject to which they relate. Committee, Mr. G. M. Wharton, Mr. G. W. Smith, Mr. Breck, Mr. Williams, and Mr. Fisher.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. MAY, JUNE & JULY, 1842. No. 22.

Stated Meeting, May 6.

Present, thirty-seven members.

Dr. CHAPMAN, Vice-President, in the Chair.

Mr. Nicollet, a member elect, was presented to the presiding officer, and signed the Laws.

Letters were read:—

From the Academy of Sciences of Paris, dated 11th Oct. 1841,—the Museum of Natural History of Paris, dated 16th Nov. 1841,—the Royal Institution of London, dated 29th Nov. 1841, and 22d Jan. 1842,—the Geological Society, dated 20th Jan. 1842,—the Zoological Society, dated 14th Jan. 1842,—the Linnean Society, dated 20th Jan. 1842,—the Society of Arts of London, dated 22d Jan. 1842,—the Boston Natural History Society, dated 6th April, 1842,—the Lyceum of Natural History of New York, dated 12th April, 1842, severally acknowledging the receipt of copies of the Society's Transactions and Proceedings:—

From the Museum of Natural History of Paris, dated 28th Feb. 1842, in relation to the transmission to this Society of the Archives of the Museum:—

From the London Electrical Society, dated 31st Dec. 1841, stating that Part III. of their Proceedings had been forwarded to this Society:—

From Mr. Samuel Bailey, dated Sheffield, 15th Dec. 1841, presenting a copy of his treatise on Berkley's Theory of Vision:—

From Messrs. R. Murchison and Edward Sabine, General

Secretaries of the British Association, dated 12th Feb. 1842, requesting to be informed whether any members of this Society would attend the annual meeting of the Association in June next:—

From Mr. William Vaughan, of London, dated 5th March, 1842, relating to a parcel forwarded on behalf of the Linnean Society:—and

From Dr. D. Humpreys Storer, dated 24th April, 1842, and Mr. Simeon Borden, dated 25th April, 1842, severally acknowledging the honour done them by their election as members of the Society.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Royal Astronomical Society of London. Vol. V. Nos. 19 & 20. 8vo. London, 1842.—*From the Society.*

Twenty-fifth Annual Report of the Superintending Committee of the London Provident Institution. 8vo. London, 1841.—*From Mr. William Vaughan.*

A Review of Berkley's Theory of Vision, designed to show the Unsoundness of that Celebrated Speculation. By Samuel Bailey. 8vo. London, 1842.—*From the Author.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No 9. For March. 8vo. Philadelphia, 1842.—*From the Editor.*

Manners and Household Expenses of England in the Thirteenth and Fifteenth Centuries. By Beriah Botfield, Esq. 4to. London, 1841.—*From the Author.*

The Manuscript Rarities of the University of Cambridge. By James Orchard Halliwell, Esq. 8vo. London, 1841.—*From the Author.*

The Character of Sir John Falstaff. By James Orchard Halliwell, Esq. 12mo. London, 1841.—*From the Author.*

List of Members of the Royal Society. 30th November, 1841. 4to. London, 1841.—*From the Society.*

The Journal of the Royal Geographical Society of London. Vol. XI. Part 1. 8vo. London, 1841.—*From the Society.*

Proceedings of the London Electrical Society. Session 1841-2. 8vo. London, 1841.—*From the Society.*

Fifty-fifth Annual Report of the Regents of the University of the

State of New York. Made to the Legislature, March 1, 1842. 8vo. Albany, 1842.—*From the Regents.*

Jahrbucher der Literatur. Nos. 93 to 96 inclusive. 8vo. 1841.—*From the Baron von Hammer Purgstall.*

On a New Magnetic Instrument for the Measurement of the Inclination and its Changes. By the Rev. Humphrey Lloyd. 8vo. Dublin, 1842.—*From the Author.*

Ueber den Galvanismus als chemisches Heilmittel gegen örtliche Krankheiten, von Dr. Gustav Crusell. Mit einem Schreiben von M. Markus. 8vo. St. Petersburg, 1841.—*From the Author.*

Mémoires de l'Académie Impériale des Sciences de Saint Pètersbourg. VIme. Série. Première Partie, *Sciences Mathématiques et Physiques.* Vol. II. Parts 5 & 6. 4to. St. Petersburg, 1840. *From the Academy.*

Mémoires de l'Académie, &c. Seconde Partie, *Sciences Naturelles.* Vol. III. Parts 5 & 6, & Vol. IV. Parts 1, 2, 3, 4 & 5. 4to. St. Petersburg, 1840–41.—*From the same.*

Mémoires de l'Académie, &c. *Sciences Politique, Histoire et Philologie.* Vol. IV. Part 6, & Vol. V. Parts 1, 2, 3 & 4. 4to. St. Petersburg, 1840–41.—*From the same.*

Mémoires de l'Académie, &c. Mémoires par Divers Savans, et lus dans ses Assemblées. Vol. IV. Parts 3 & 4. 4to. St. Petersburg, 1841.—*From the same.*

Recueil des Actes de la Séance Publique de l'Académie Impériale des Sciences de Saint Pètersbourg, tenue le 29 Décembre, 1840. 4to. St. Petersburg, 1841.—*From the same.*

Institut Royal de France. Rapport du Secrétaire Perpétuel de l'Académie Royale des Inscriptions et Belles Lettres, etc. Lu le 14 Janvier, 1841. Paris, 1841.—*From the Institute.*

Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. Uitgegeven door J. Van der Hoeven en W. H. de Vriese. Vol. IX. Part 1. 8vo. Leyden, 1841.—*From the Editors.*

Case, and Opinion of P. S. Du Ponceau and A. Davezac, Counsellors, on the Contested Seat of the Hon. David Levy. 8vo. Alexandria, D. C., 1841.—*From Mr. Du Ponceau.*

FOR THE CABINET.

Specimens of Wood taken from a beam out of the Ruins of Uxmal, Central America. This wood is derived from a tree called *zapodillo*, and is said by the natives to be insusceptible of decay.—*From Mr. James M'Kennan.*

A Specimen of Sponge, and Nineteen Specimens of Shells, from Central America.—*From the same.*

Prof. Bache read a paper, entitled "Observations of the Magnetic Dip in the United States, Fourth Series, by Elias Loomis, Professor of Mathematics and Natural Philosophy in Western Reserve College, Ohio," which was referred to a Committee.

Professor Loomis begins this paper by giving the results of further experiments to test the accuracy of the axle of his dipping needle, namely, a series made by Mayer's method; these proved satisfactory, the individual results presenting some discrepancies, but the mean agreeing very nearly with the dip previously obtained. The mean of observations hitherto made with this needle by the usual method, and by the series in different azimuths and by Mayer's method combined, differed but 0.1′, correction having been made to reduce the observations to the same epoch.

Prof. Loomis then gives the magnetic dip observed by the ordinary method at the following named places, as follows:

Brooklyn, Ohio, April 23, 1841, lat. 41° 30′ N., long. 81° 43′ W., Dip 73° 16′.3.

Tallmadge, Ohio, April 26, lat. 41° 06′ N., long. 81° 27′ W., Dip 72° 55′.2.

Tallmadge, Ohio, Oct. 13, lat. 41° 06′ N., long. 81° 27′ W., Dip 72° 51′.5.

Cleveland, Ohio, August 12, lat. 41° 30′ N., long. 81° 41′ W., Dip 73° 04′.3.

Monroe, Michigan, Aug. 14, lat. 41° 55′ N., long. 82° 28′ W., Dip 73° 19′.0.

Ypsilanti, Michigan, August 16, lat. 42° 14′ N., long 83° 38′ W., Dip 73° 18′.8.

Ann Arbor, Michigan, Aug. 16, lat. 42° 18′ N., long. 83° 45′ W., Dip 73° 16′.5.

Detroit, Michigan, Aug, 17, lat. 42° 19′ N., long. 83° 03′ W., Dip (mean of four series at three stations) 73° 35′.3.

Mackinac, Michigan, Aug. 21, lat. 45° 51′ N., long. 84° 41′ W., Dip (mean of four series at two stations) 76° 38′.9.

Fort Brady, Michigan, Aug. 25 & 27, lat. 46° 30′ N., long. 84° 24′ W., Dip (mean of three series at three stations) 77° 29′.7.

Gros Cap, Canada, Aug. 26, lat. 46° 32′ N., long. 84° 43′ W., Dip 77° 05′.3.

South Manitou, Michigan, Aug. 31, lat. 45° 05′ N., long. 85° 38′ W., Dip 75° 59′.3.

Chicago, Illinois, September 2, lat. 41° 53′ N., long. 87° 44′ W., Dip (mean of two series at two stations) 72° 47′.7.

Galena, Illinois, September 4, lat. 42° 28′ N., long. 90° 13′ W., Dip (mean of two series at two stations) 73° 02′.1.

Galena, Illinois, September 13, lat. 42° 28′ N., long. 90° 13′ W., Dip 73° 03.′0.

Mineral Point, Wisconsin, Sept. 6, lat. 42° 51′ N., long. 89° 58′ W., Dip 73° 23′.2.

Mineral Point, Wisconsin, Sept. 10, lat. 42° 51′ N., long. 89° 58′ W., Dip 73° 23′.0.

Blue Mounds, Wisconsin, Sept. 7, lat. 43° 00′ N., long. 89° 36′ W., Dip 73° 34′.9.

Madison, Wisconsin, Sept. 8, lat. 43° 03′ N., long. 89° 11′ W., Dip (mean of two series at two stations) 74° 06′.5.

Campbell's, Wisconsin, Sept. 9, lat. 43° 01′ N., long. 89° 26′ W., Dip 73° 28′.1.

Hickok's, Wisconsin, Sept. 9, lat. 42° 58′ N., long. 89° 47′ W., Dip 73° 39′.5.

Platteville, Wisconsin, Sept. 11, lat. 42° 43′ N., long. 90° 14′ W., Dip (two series at two stations) 73° 17′.4.

Peru, Illinois, Sept. 16, lat. 41° 23′ N., long. 89° 05′ W., Dip (two series at two stations) 71° 51′.1.

Pekin, Illinois, Sept. 18, lat. 40° 35′ N., long. 89° 36′ W., Dip 71° 13′.2.

Copperas Creek, Illinois, Sept. 18, lat. 40° 30′ N., long. 89° 48′ W., Dip 71° 04′.0.

Alton, Illinois, Sept. 22, lat. 38° 54′ N., long. 90° 04′ W., Dip (two series, at two stations) 69° 34′.8.

Upper Alton, Illinois, Sept. 22, lat. 38° 55′ N., long. 90° 03′ W., Dip (two series, at two stations) 69° 45′.7.

Edwardsville, Illinois, Sept. 23, lat. 38° 50′ N., long. 89° 53′ W., Dip 69° 57′.7.

Bunker Hill, Illinois, Sept. 24, lat. 39° 04′ N., long. 89° 53′ W., Dip 69° 49′.1.

Monticello, Illinois, Sept. 25, lat. 38° 57′ N., long. 90° 05′ W., Dip 69° 38′.9.

St. Louis, Missouri, Sept. 29, lat. 38° 38′ N., long. 90° 04′ W., Dip 69° 25′.5.

Vincennes, Indiana, October 1, lat. 38° 43′ N., long. 87° 29′ W., Dip (two series, at two stations) 69° 52′.8.

Cincinnati, Ohio, Oct. 5, lat. 39° 06′ N., long. 84° 27′ W., Dip 70° 27′.7.

Columbus, Ohio, Oct. 7, lat. 39° 57′ N., long. 83° 03′ W., Dip 71° 03′.7.

Hebron, Ohio, Oct. 8, lat. 39° 59′ N., long. 82° 29′ W., Dip (two stations) 71° 10′.1.

Frazersburgh, Ohio, Oct. 9, lat. 40° 09′ N., long. 82° 08′ W., Dip (two stations) 71° 48′.7.

Dover, Ohio, Oct. 11, lat. 40° 33′ N., long. 81° 30′ W., Dip 72° 19′.2.

Fulton, Ohio, Oct. 12, lat. 40° 55′ N., long. 81° 38′ W., Dip 72° 38′.9.

Clinton, Ohio, Oct. 12, lat. 40° 58′ N., long. 81° 40′ W., Dip 72° 44′.0.

Hudson, Ohio, Oct. 27, lat. 41° 15′ N., long. 81° 27′ W., Dip 72° 48′.7.

Hudson, Ohio, November 13, lat. 41° 15′ N., long. 81° 27′ W., Dip 72° 48′.7.

Prof. Bache also read a note by Prof. Loomis, as a supplement to his paper on the Storm of December 20, 1836, which was referred to a Committee.

These supplementary meteorological observations include the height of the barometer, and are from the journals of Mr. J. N. Nicollet, at Fort Snelling, lat. 44° 53′ N. and long. 93° 12′ W., and of Prof. Joseph Ray, at Cincinnati. They are important, as showing that the coincidence of the period of minimum of the barometer and of the change of wind to the N. W. was not general, and lead to an increased curvature in the lines of barometric minimum in the north-western part of the United States. The conclusion which Professor Loomis draws is, that "the atmospheric wave in latitude 45° travelled with nearly twice the velocity it did in latitude 30°. The entire range of the barometer at Fort Snelling, was .67 inch, about half what it was in longitude 72° in the same parallel. At the same rate, the oscillation would be reduced to about one-third of an inch in the neighbourhood of the Rocky Mountains."

Mr. Walker read a paper, entitled "Astronomical Observations made at various Places in the United States, by J. N. Nicollet," which was referred to a Committee.

This paper contains a list of Observed Transits of Mercury, Solar Eclipses, and Occultations of fixed Stars, chiefly by Mr. Nicollet and Prof. Verot.

No.	Date.	Phase.	Place.	Mean Time.	Observer.
	1824.			*h. m. s.*	
1	June 26	Begin. solar ecl.	Fort Charlotte	6 7 1.00	Ferguson.
2	,, 26	End ,,		7 13 19.20	,,
	1832.				
3	May 4	Em. Merc. I. L.	St. Mary's College	22 28 37.20	Nicollet.
4	,, 4	,, centre	Baltimore	22 29 33.90	,,
5	,, 4	,, II. L.	,,	22 30 46.60	,,
6	July 7	Im. γ Libræ d. l.	,,	10 0 4.63	,,
7	,, 26	Begin. solar ecl.	,,	18 47 35.95	,,
8	,, 26	End	,,	20 31 48.05	,,
9	,, 26	Begin.	,,	18 47 48.95	Verot.
10	,, 26	End	,,	20 31 35.07	,,
11	Nov. 28	Im. γ Capri. d. l.	,,	6 12 10.25	Nicollet.
	1834.				
12	Mar. 12	Im. ν Piscium	,,	7 26 50.00	Verot.
13	Sept. 14	Im. $\downarrow$ Capricorni	,,	8 13 41.00	,,
14	Nov. 9	Im. γ Aquarii	,,	5 43 0.00	,,
15	,, 30	Begin. solar ecl.	,,	0 51 58.80	,,
16	,, 30	End ,,	,,	3 31 31.20	,,
17	,, 30	Begin. ,,	Milledgeville, Ga.	0 15 7.00	Nicollet.
18	,, 30	Begin. tot. dark.	,,	1 42 36.70	,,
19	,, 30	End ,,	,,	1 43 52.00	,,
20	,, 30	End solar ecl.	,,	3 5 28.10	,,
	1835.				
21	May 3	Im. $\downarrow$ Geminor.	Baltimore	10 27 45.00	Verot.
22	Nov. 7	Em. Merc. cent.	,,	0 27 12.00	,,
23	,, 7	II. L.	,,	0 28 8.00	,,
	1836.				
24	May 14	Begin. solar ecl.	,,	*18 53 45.00	,,
25	,, 14	End ,,	,,	*21 19 32.00	,,
	1838.				
26	June 30	Im. α Virginis	Red Pipe Stone Quarry	10 43 7.28	Nicollet.
27	Sept. 18	Begin. solar ecl.	Baltimore	3 7 22.00	Verot.
38	,, 18	Form. ring ,,	,,	4 25 33.00	,,
29	,, 18	Rupt. ring ,,	,,	4 30 54.00	,,
30	,, 18	End ,,	,,	5 40 41.00	,,
31	,, 18	Begin. ,,	Ti Tanka Taminan	Not observ'd	Nicollet.
32	,, 18	End ,,	Lake	4 18 6.85	,,
33	,, 18	Begin. ,,	Newport, Mo.	1 53 16.77	Goebel.
34	,, 18	End ,,	,,	4 40 42.22	,,
	1839.				
35	July 6	Em. η Tauri	Coteau du Missouri	15 49 35.50	Nicollet.
36	Nov. 20	Im. ,,	St. Louis	6 12 14.70	,,
	1841.				
37	June 5	Im. σ Sagittarii	Newport, Mo.	15 40 7.94	Goebel.

* Nos. 24 and 25 are clock time, the rest are mean time of the place of observation.

Nos. 1 & 2, by Mr. James Ferguson, Astronomer to the American Commission for determining the Northern Boundary. Dollond, 2½ feet, power 60. Latitude 47° 58′ 34″; long. 5*h* 59*m* 58*s*.0 West of Greenwich.

Nos. 3—5, by Mr. Nicollet, at St. Mary's College, Baltimore. Lat. 39° 17′ 55″; long. 5*h* 6*m* 30*s*. Dollond, p. 100. Nos. 4 & 5, very correct. Time recorded by the Rev. Mr. A. Verot, Professor of Mathematics and Natural Philosophy, in St. Mary's College.

Nos. 6—11, good observations. No. 7, with power 75; No. 8, power 100; Nos. 9 & 10, power 30. Time noted by Professor Ducatel; No. 11, power 100.

Nos. 17—19, by Mr. Nicollet, at Milledgeville State House—Senate Hall. Lat. 33° 4′ 30″; long. 5*h* 33*m* 20*s*. The telescope was procured by Mr. Nicollet of Dr. Milton Antony. Mr. Nicollet was assisted by Drs. Dugas and Ford, of the Medical College of Augusta.

Nos. 24 & 25, time by chron. Therm. 55°,

7*h*	5*m*	9*s*,	by obs. sun's centre alt.	25° 42′	32.″7.
8	39	39		43	52 35.1.

Correction of index error additive 15″ to sun's alt.

No. 26, by Mr. Nicollet, at the "Red Pipe Stone Quarry," on the "Coteau des Prairies," Sioux Indian Country, Iowa Territory. Latitude 44° 0′ 52″; long. 6*h* 25*m* 17*s*; assisted by Lieut. Charles Tremont, of the U. S. Topographical Engineers.

No. 32, by Mr. Nicollet, power 100, Dollond, clear sky, on the east shore of Ti Tanka Taminan Lake, Lahontan River, Sioux Country, Iowa Territory. Lat. 44° 16′ 41″; long. 6*h* 13*m* 23.*s*0.

Nos. 33 & 34, by Dr. Goebel, at his residence near Newport, Franklin County, Missouri, power 40. Lat. 38° 33′ 58″; long. 6*h* 4*m* 28.*s*6.

No. 35, by Mr. Nicollet, at his encampment on the "Coteau du Missouri," Tanktonan Indian Country. Lat. 44° 51′ 11″; long. 6*h* 36*m* 18*s*.

No. 36, by Mr. Nicollet, at the garden of the Cathedral, St. Louis, Missouri. Lat. 38° 37′ 28″; long. 6*h* 1*m* 0.*s*7.

Prof. Bache read a communication from Lieut. J. M. Gilliss, U. S. N., director of the Magnetic Observatory at Washington, containing a description of the Observatory and of the declination instrument, with the means of the observations for 1840, at the different magnetic hours. This communication was referred to a Committee.

Dr. Hare communicated orally an experiment, showing that foggy air is not a conductor of electricity.

He adverted to the well known influence of moisture in paralyzing the efficacy of electrical apparatus. When the dew point is so high as to deposite moisture on the walls within doors, the most powerful machines were found incompetent to generate electrical excitement.

Dr. J. K. Mitchell having expressed the opinion, founded on some

facts by him noticed, that this deterioration was not the consequence of the direct conducting power of the mixture of air and aqueous vapour, within which the apparatus was situated, but of the adjacent solid surfaces thereby moistened, Dr. Hare determined to ascertain by experiment, whether the view taken by Dr. Mitchell was correct, being the more encouraged to expect an affirmative issue, from the copious evolution of electricity which had been recently ascertained to take place during the condensation of high steam.

Dr. Hare proceeded to describe his experiment. A cup of hot water, to supply vapour, was placed within a large bell glass, having an open neck of above three inches in diameter; so that the centre of the neck might be immediately under the positive conductor of a large electrical machine. A knob, communicating with the negative conductor, was supported in the centre of the bell glass. Next a red-hot rod of iron, terminating in a knob, was suspended by a wire from the positive conductor, so as to descend, concentrically, through the neck, until within striking distance of the knob above mentioned.

It will be perceived that, in consequence of the high temperature of the rod, and the heat radiating from it to the neck of the bell glass, no moisture could condense upon either, so as to impair the power of the former to give sparks, or of the latter to act as a non-conductor.

The apparatus being thus prepared, and the machine in operation, sparks were found to pass through the foggy air occupying the cavity of the bell glass, as if no moisture had been present.

Dr. Hare conceived that the fact that the aqueous vapour does not impair the insulating power of air, must justify some important meteorological inferences. It was well known that pith balls and other light bodies separate when under the effect of electrical excitement, and it had been justly assumed that the circumambient air must be similarly affected. Thus, when, by its condensation, aqueous vapour evolves electricity, as it does not destroy the insulating power of the air, the aërial particles must be surcharged with that fluid. But, since charging with electricity must cause, in those particles, a disposition to remove from each other to a greater distance, the air must occupy a greater bulk, in proportion as it is more highly charged: in other words, it must be rarefied, and rendered specifically lighter. Hence it will rise to a greater elevation than its temperature, unassisted by electrical reaction, would enable it to reach. It follows that a sudden discharge of electricity, such as is productive of lightning, by causing a sudden augmentation of gravity, may induce a descent of the mass

of aëriform matter and moisture thus discharged. Hence might arise the squalls which accompany electrical storms.

Moreover, large masses of moist air, being thus rendered preternaturally light by electrical excitement, may be made to rise to a situation sufficiently cold to cause the congelation of their moisture; and a simultaneous discharge of electricity ensuing, by a species of reaction the aqueous particles may tend to coalesce with an accelerated force, acting oppositely to that by which they had been kept unduly asunder, and thus be aggregated into the lumps of ice called hail.

In many cases, a reciprocal action between thunder clouds had been noticed, and had been explained by supposing them to be differently electrified. This supposition was rendered now reasonable by the fact that, per se, moisture does not destroy the insulating property of air, as demonstrated by the experiment described in the commencement of this communication.

Dr. Hare made a further oral communication, in relation to the fusibility of iridium and rhodium.

He stated his impression that neither iridium nor rhodium, two of the metals accompanying the native grains of platinum, had heretofore been fairly fused. By the colossal battery of Children, a globule of fused iridium is alleged to have been obtained; but both the admitted porosity and specific gravity of that specimen furnished objections to its being considered as pure. Of both the metals in question, by means of his hydro-oxygen blowpipe, within a few months previous, Dr. Hare had succeeded in fusing specimens of unquestionable purity. He had also fused the osmiuret of iridium, as existing in the native spangles, associated with platinum ore. This alloy was found much more difficult of fusion than pure iridium. Both iridium and rhodium became more fusible by continued and repeated fusion. Both appeared to evolve some volatile matter, and did not become completely solid until after being repeatedly fused.

Mr. Walker informed the Society, that Prof. Loomis had succeeded in observing Encke's comet, at its late return, with a five feet Equatorial, by Simmes, belonging to Western Reserve College. Mr. W. further stated, that Professor Loomis had made some interesting observations on a tornado, which had recently passed over a district in the north of Ohio, and that the phenomena tended to confirm the theory of a rotary motion.

Dr. Hays called the attention of the Society to an abstract, recently published, of a paper read by Prof. Owen to the Geological Society of London, relative to Mr. Koch's collection of mammalian remains.

Prof. Owen, it is stated, by a series of comparisons of the lower jaws in that collection, has "arrived at the conclusion, that the *Tetracaulodon* of Godman is the immature state of both sexes of the *Mastodon giganteum*, and that it loses these distinctions in the mature state of both sexes, by the loss of one tusk in the male, and by the loss of both in the female."

Prof. O. conceives, that these views are supported by analogies, and he refers to the Dugong and Narwhal as examples. In the former, in both sexes, the lower jaw is provided, at its deflected extremity, with six incisors, which disappear in the mature animals, one or two abortive remnants at most being occasionally discovered hidden in the irregular cancellous sockets. In the male Dugong the upper incisors are protruded, scalpriform, and of unlimited growth; while in the female they are concealed, cuspidate, and solid at their base, which is expanded.

In the Narwhal, the young of both sexes have a single incisor equally developed on each side of the upper jaw; one of which grows rapidly in the male, constituting the well-known spirally twisted tusk, while the other remains stationary; and both continue rudimental in the female.

Dr. Hays awarded to Prof. Owen's theory the merit of being very ingenious, of embracing all the facts presented by the collection of Mr. Koch, and of explaining several difficulties which had hitherto existed; still he conceived that it was founded on too limited observations to challenge our implicit credence. A complete series of jaws of both sexes and of all ages, which is necessary to settle this question, has never yet been brought to light, and Dr. H. could not, therefore, refer the Society to any specimens which refuted the above theory; but still he would invite the attention of the Society to some, which, at least, created strong doubts of its entire correctness.

Dr. H. then exhibited two casts, one representing the chin and right side of a lower jaw, belonging to the museum of the University of Virginia, figured in Vol. IV. N. S. pl. XXVII, of the Society's Transactions; the other, the left side of a lower jaw, in the Wistar Museum, and figured in Trans. Vol. IV. N. S. pl. XXI. Both of these had appertained to animals of the same age and adolescent (having two molars only left, the ultimate and penultimate ones); yet

the first had had two tusks of the largest size, whilst the second had none, or any trace of alveolus. Two lower jaws in the cabinet of the Society, of nearly the same age, (described and figured in the Trans. Vol. IV. Plates XXIV. and XXV.) were also destitute of tusks, or alveoli for them.

Dr. H. examined the analogies adduced by Prof. Owen in support of his theory, and expressed the opinion that they were very remote; and as the extensive knowledge of that distinguished naturalist had not furnished him with closer ones of the desired character, it was clearly presumable that none could be adduced.

A much closer analogy, Dr. H. observed, was to be found in the Dinotherium, a very nearly allied animal; but so far as its remains, hitherto obtained, enabled us to decipher its history, it was furnished with two tusks in the lower jaw.

On the whole, Dr. H. saw little reason to change the opinion first expressed by him (see Trans. Vol. IV. p. 318.) that "it is impossible in the existing state of our knowledge, and with our present materials, either to confirm or positively refute the suggestion," that the tusks in the lower jaw are a mere sexual character. The honour of establishing this point is yet to be reaped. Should the suggestion, however, prove correct, Dr. H. believed it would be found that the male had two tusks in the lower jaw, instead of one, as supposed by Prof. Owen; and that the jaw in Mr. Koch's collection, containing a single tusk, is to be considered an anomaly.

Stated Meeting, May 20.

Present, twenty-three members.

Dr. Patterson, Vice-President, in the Chair.

Letters were read:—

From M. Alexis de Tocqueville, dated Paris, 7th April, 1842, acknowledging the honour done him by his election as a member of this Society:—also from Dr. Locke, of Cincinnati, dated 12th May, 1842, accompanying a donation, presented through Mr. Dobson.

The following donations were announced:—

FOR THE LIBRARY.

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia. No. 2. For Feb. March and April. 8vo. Philadelphia, 1842.—*From the College.*

The American Medical Library and Intelligencer. By R. Dunglison, M.D. New Series. Vol. I. No. 10. For April. 8vo. Philadelphia, 1842.—*From the Editor.*

Report upon the Standards of the Liquid Capacity Measures, &c. &c. with Description of a New Original Barometer, and of the Balance for adjusting the Half-bushels by their Weight of Distilled Water. By F. R. Hassler. Senate Document, No. 225. 2d Session, 27th Congress.—*From the Author.*

Tabular View of the Scholastic Institutions in the Russian Empire. 4to. St. Petersburg, 1838.—*From the Imperial Academy of Sciences of St. Petersburg.*

Case, and Opinion of P. S. Du Ponceau and A. Davezac, Counsellors, on the Contested Seat of the Hon. David Levy, Delegate from Florida.—*From the Hon. David Levy.*

FOR THE CABINET.

A Collection of Casts of Fossils, chiefly of Western Rocks.—*From Prof. John Locke.*

The Committee, consisting of Prof. Bache, Mr. Nicollet and Dr. Patterson, to whom was referred the paper of Prof. Loomis, entitled, "Observations of the Magnetic Dip in the United States, Fourth Series," reported in favour of its publication in the Transactions of the Society; and the publication was ordered accordingly.

The same Committee reported in favour of publishing in the Transactions, Professor Loomis's Supplementary Observations on the Storm which occurred about the 20th of December, 1836; and its publication was ordered accordingly.

The Committee, consisting of Mr. Walker, Dr. Patterson and Prof. Kendall, to whom was referred the paper of Mr. Nicollet, entitled, "Astronomical Observations made at various Places in the United States," recommended the same for publication in the Society's Transactions, and the recommendation was adopted.

Mr. Walker read a paper, entitled, "Observations of Encke's Comet in March and April, 1842, at the High School Observatory, with the 9 feet Fraunhofer Equatorial, by Sears C. Walker and E. Otis Kendall;" which was referred to a Committee.

The true right ascensions and declinations of the stars of comparison, on the evenings of observation, are stated in the paper as follows:

$a = 1\ 46\ 11.18$,	$a' = +$	16 46 26.04,	*9	Mag.,	Bessel's Zone, No. 394.
" 1 46 11.28,	"	16 46 31.26,	9	"	Lalande H. C., p. 192.
$b = 1\ 46\ 10.55$,	$b' =$	16 41 24.72,	9	"	Bessel's Zone, No. 394.
$c = 1\ 49\ 25.88$,	$c' =$	16 46 1.69,	8	"	" " "
" 1 49 25.51,	"	16 46 8 32,	8.9	"	Lalande, H. C., p. 192.
$d = 1\ 49\ 41.70$,	$d' =$	16 52 32.70,	10	"	Anonym. Approx.
$f = 2\ 1\ 4.60$,	$f' =$	17 15 12.90,	10	"	" "
$g = 1\ 59\ 6.71$,	$g' =$	17 16 29.60,	7.8	"	Bessel's Zone, No. 394.
" 1 59 6.51,	"	17 16 33.80,	7.8	"	" " " 332.
" 1 59 6.01,	"	17 16 29.60,	7.8	"	Piazzi
$h = 2\ 3\ 52.90$,	$h' =$	17 16 51.50,	10	"	Anonym. Approx.
$i = 2\ 17\ 18.20$,	$i' =$	17 17 0.70,	9.10	"	" "
$k = 2\ 31\ 58.31$,	$k' =$	15 0 18.69,	8.9	"	Bessel's Zone, No. 394.
" 2 31 58.10,	"	15 0 20.83,	8.9	"	" " " 141.
$l = 2\ 32\ 46.87$,	$l' =$	14 57 48.28,	9	"	" " " 141.
" 2 32 47.35,	"	14 57 51.90,	9	"	" " " 32.

The measures and transits observed with the Filarmicrometer were reduced by the formulæ of Bessel in the Astr. Nachr. No. 69, and in the Königsberg Observations, Vol. XV. p. 22. Those of the same star were referred to a common epoch, by means of Encke's Ephemeris. The probable errors were computed in the usual manner. The true places of the comet in right ascension and declination, were obtained free from aberration, parallax and refraction.

Date.	Sidereal time at Philadelphia. μ	Comet's place freed from Aberration, Parallax, and Refraction.		No. of single results.
		α = Comet's true R. A.	δ = Comet's true dec.	
1842.	$h\ m\ s$	$m\ s\ \ s$	$'\ \ ''\ \ ''$	
March 27	7 54 57	$a + 0\ 18.358 \pm 0.06$	$a' - 1\ 29.38 \pm 1.9$	3
" 27	7 59 21	$b + 0\ 20.404 \pm 0.60$	$b' + 3\ 29.28 \pm 2.3$	3
" 28	7 37 55	$c + 0\ 39,279 \pm 0.16$	$c' + 7\ 43.22 \pm 2.1$	5
" 28	7 50 54	$d + 0\ 22.790 \pm 0.03$	$d' + 1\ 20.91 \pm 0.3$	2
" 31	7 54 35	$f - 0\ 7.860 \pm 0.12$	$f' - 1\ 46.13 \pm 1.6$	4
" 31	8 36 34	$g + 1\ 56.222 \pm 0.65$		3
April 1	7 50 51	$h + 0\ 38.149 \pm 0.34$	$h' - 0\ 8.51 \pm 0.4$	3
" 5	8 42 12	$i + 0\ 45.608$	$i - 11\ 26.31$	1
" 11	8 53 36	$k - 1\ 41.525 \pm 0.19$		4
" 11	8 54 1	$l - 2\ 29.715 \pm 0.28$		4

By applying the places of the known stars in the above collection, the final results are found as follows:

Date.	Sidereal time at Philadelphia.	Comet's true R. A. and Dec. from Observation.		Correction of Encke's Ephemeris.		No. of results.	Authority for Star's Place.
	μ	α	δ	Cos $\delta\Delta\alpha$	$\Delta\delta$		
1842.	*h m s*	*h m s*	° ′ ″	*s.*	″		
Mar. 27	7 54 57	1 46 29.54	+16 44 56.7	+ 0.57	+ 5.4	3	Bessel's Zones.
,, 27		1 46 29.64	+16 45 1.9	+ 0.67	+10.6	3	Lalande H. C.
,, 27	7 59 21	1 46 30.95	+16 44 54.0	+ 1.30	+ 0.9	3	Bessel's Zones.
,, 28	7 37 55	1 50 5.16	+16 53 44.9	+ 2.75	+ 2.6	5	,, ,,
,, 28		1 50 4.79	+16 53 51.5	+ 2.40	+ 9.3	5	Lalande H. C.
,, 31	8 36 34	2 1 2.83		+ 0.33		3	Bessel's Zones.
,, 31		2 1 2.23		— 0.24		3	Piazzi.
April 11	8 53 36	2 30 16.67		— 1.85		4	Bessel's Zones.
,, 11	8 54 1	2 30 17.40		— 1.16		4	,, ,,

Mean of 33 results, cos $\delta\Delta\alpha = +\ 0s.65 \pm 0s.32$.
,, 19 ,, $\Delta\delta = +\ 5''.8 \pm 1''.2$.

Dr. Hare laid before the Society various specimens of fused iridium, osmiuret of iridium, and of rhodium.

The largest mass of iridium weighed sixty-seven grains; that of rhodium ninety grains. The former leaned towards the pale brilliant white of antimony, the latter towards the ruddy hue of bismuth. Both metals had a pre-eminent disposition to crystallize. The rhodium, in congealing from the state of a globule as fluid as mercury, became studded all over its surface with crystalline facets, excepting the portion in contact with the support. A portion of the interior of a globule of iridium ran out during congelation, coating the outside partially with crystalline facets. This excessive propensity to crystallize rendered it difficult to obtain regular globules of this metal. This propensity was displayed in a higher degree by the native osmiuret. Dr. Hare suggested that the greater difficulty of fusing this alloy might be ascribed to the infusibility of osmium, which might resemble carbon in forming a volatile oxide, and in being infusible per se.

Dr. Hare made some remarks respecting the cause of the persistence of clouds between certain elevated levels.

He said that, in the last number of the Society's "Proceedings," a brief mention had been made of some observations and an explana-

tion advanced by him respecting the suspension of clouds. He had, however, to regret that the most essential parts of his communication had not been reported. With the permission of the Society, he would recapitulate his communication, in order that the readers of the "Proceedings," and members who were not present when he spoke on the subject in question, might not have an erroneous impression. He would also add some suggestions which had recently occurred to him.

It is well known that, although there were occasionally two different sets of clouds pertaining severally to different currents of air, one above the other,—usually, in fair weather, there was but one set. In either case all the clouds belonging to one current are seen to be situated somewhere between two levels. Above the space, included between these levels, none are seen to rise; nor are any observed to sink below its lower boundary. It was conceived that the causes of this persistence of the clouds between two horizontal planes, of which the lower one is usually more than a mile in height, had never been satisfactorily assigned.

Agreeably to the prevalent impression that clouds are enduring masses of condensed aqueous vapour, their specific gravity ought to be much greater than that of the subjacent cloudless air, over which they swim; since the little watery bubbles of which they are formed, consist, not only of the air with which they are inflated, but also of a liquid 840 times as heavy. But he had of late years observed that clouds are not as durable as generally supposed. On the contrary, like the steam condensed in escaping from boiling water, they are incessantly forming by the condensation of aqueous vapour, and disappearing in consequence of its being vaporized again. A cloud may appear to cling to the brow of a mountain, sometimes for more than an hour; when, on closer examination, it may be discovered that, as one portion appears, another vanishes, and that the apparent durability is due to the equality of the causes of condensation and re-vaporization. Dr. Hare had enjoyed a fine opportunity of verifying this view of the subject, when involved within a cloud on the summit of the Rhigi, last summer. It was then quite evident, that what might, at a distance, be mistaken for an enduring mass of condensed moisture, such as is called a cloud, was really due to a current of air, saturated with aqueous vapour, which was rushing up the mountain side. As this current reached a level, at which the temperature was below its dew point, the contained vapour was converted by condensation into a cloud; but as it attained a higher level, where the dew point was sufficiently low to compensate for the cold, the moisture was made to resume the aëriform state.

As in condensing, steam relinquishes as much heat as would make it red-hot, if retained while under sufficient pressure to keep it in the liquid state, it follows that, as the cloud is formed, the temperature of the air with which it is associated is raised so much as to produce a buoyancy which enables it to float or even to ascend;* but as soon as it reaches a point where the air is so devoid of aqueous vapour as to permit it to be revaporized, a proportionable refrigeration and increase of density ensues. Thus the buoyancy produced at one level, is compensated by a commensurate opposite influence at another. Of course, the clouds are always seen to occupy an interval between two horizontal planes, one above the other. As soon as the aqueous vapour of the air rises above the lower plane it condenses; before the cloud thus produced can get beyond the upper one it is reconverted into vapour.

When the causes of condensation are more potent than those of revaporization, rain ensues; when the opposite is the case, there must be a tendency to fair weather.

Although of opinion that in hurricanes and other violent rain storms, there must be an exchange of position between the lower and upper strata of the air, it was conceived that showers, unaccompanied by gales or squalls, were to be explained as above suggested.

Dr. Hare had conceded that there might be more than one cause for the buoyancy of clouds. Dr. Thomson, in his treatise respecting Heat and Electricity, suggests electricity as a cause. The fact demonstrated by the experiment, the results of which had been communicated to the Society at their last meeting in April, that moisture does not render air a conductor of electricity, gives support to this view of the subject; especially since it has been discovered, that in condensing, steam becomes highly electrified. It seems inevitable that the aqueous globules, of which clouds are constituted, must separate from each other, as pith balls are seen to do when similarly excited; and that the particles of air with which they are associated must be similarly actuated: hence a cause of rarefaction, and of course of buoyancy. Another cause might co-operate. It is known that the radiation of heat, which causes dew and sometimes hoar-frost, is so completely checked by clouds, that the last mentioned phenomenon never takes place when the sky is overcast. Moreover, it is known that the solar rays pass through the air without imparting heat,

* See a verbal communication of Dr. Hare, made July 3d, 1840, and published in the "Proceedings" for that time.

until intercepted by solids or liquids. It follows that the air in which clouds are situated, will be warmer than that above and below them.

Thus radiant heat and electricity may promote their buoyancy; nevertheless their persistency between two levels must be ascribed to the process noticed on the summit of the Rhigi.

Mr. Espy had the merit of drawing the attention of meteorologists more strongly to the fact, *previously made known by Dalton*,* that, although cold is produced by the rarefaction of air containing vapour, yet the reduction of temperature is less, whenever the vapour is condensed, than it would have been in air free from vapour.

In adopting the explanation above given, Dr. Hare had been prompted by his knowledge of Mr. Espy's suggestions founded on those of Dalton, so far as a superior temperature had been ascribed to the air containing a recent cloud.

Mr. Boyè made an oral communication relative to a white crystalline mineral, which occurs three or four miles to the south of West Chester, Pa., and which encloses corundum and several other mineral species.

The specimen was handed to him for examination by Mr. Nuttall, several years since, and, proving to be a silicate closely allied to a felspar, he subjected it to analysis, in conjunction with Prof. Booth, in order to compare it with the several felspars previously investigated by them.

It forms a white translucent mass composed of densely aggregated crystalline grains, and might be mistaken, at the first glance, for a moderately coarse-grained marble, did not its hardness indicate a totally different substance. Its specific gravity is 2.612.

The analysis was performed in the manner mentioned in the Proceedings of the Society for May, 1841, and gave the following results:

		Oxygen.		
Silica,	67.72	35.18		
Alumina, with a trace of iron,	20.54	9.593		
Magnesia,	0.34	0.131	3.101	12.69
Lime,	0.78	0.219		
Soda,	10.65	2.724		
Potassa,	0.16	0.027		
	100.19			

* See Nicholson's Journal, vol. iii. p. 160, or Manchester Memoirs, vol. v. p. 515.

This composition approaches nearest to that of albite, excepting in a deficiency of silica, in which respect it resembles the albite from the vicinity of Wilmington, otherwise corresponding to it closely in composition, and agrees also with an albitic felspar from Pennsylvania, analyzed by Redtenbacher, in Prof. Rose's laboratory at Berlin, (Poggendorff's Annalen, Vol. LII. p. 469,) as shown by the following comparative table.

ALBITE.	Six miles N. W. of Wilmington, Del. *Booth & Boyé.*	Pennsylvania. Locality not stated. *Redtenbacher.*	Granular Var'y. West Chester, Pa. *Booth & Boyé.*
Silica, . .	65.46	67.20	67.72
Alumina, . .	20.74	19.64*	20.54
Sesquioxide of iron,	0.54	——	a trace.
Magnesia, .	0.74	0.31	0.34
Lime, . .	0.71	1.44	0.78
Soda, . .	9.98	9.91	10.65
Potassa, . .	1.80	1.57	0.16
	99.97	100.07	100.19

On motion of Dr. Hays, it was resolved that a set of casts of fossil remains, made at the expense of the Society, be presented to Prof. Kaup, for the Museum of Darmstadt.

On motion of Mr. Booth, it was resolved, that the Curators have authority to permit Dr. Locke, of Cincinnati, to take casts from such specimens of fossils, as in their judgment may not be injured thereby, provided that the moulds be left with the Society and become their property.

Stated Meeting, June 17.

Present, twenty-nine members.

Dr. CHAPMAN, Vice-President, in the Chair.

Letters were read:—

From E. D. Ingraham, Esq., dated 10th June, 1842, asking permission to make a transcript of Mr. Breck's unpublished memoir on the Continental Money of the United States, now in the Society's Archives:—

From the Secretary of the Committee of Physics of the

* Redtenbacher states that the alumina contained titanic acid.

Royal Society of London, dated 5th April, 1842, transmitting the first number of the Proceedings of that Committee:—and

From Mr. William Vaughan, of London, dated 7th May, 1842, announcing the transmission by him of donations from the Royal Society to the library of this Society.

The permission asked by Mr. Ingraham was granted.

The following donations were announced:—

FOR THE LIBRARY.

Report of the Eighth Meeting of the British Association for the Advancement of Science, held at New Castle in August, 1838. 8vo. London, 1839.—*From the Association, through Col. Sabine.*

Report of the Tenth Meeting of the British Association, held at Glasgow, in August, 1840. 8vo. London, 1841.—*From the same.*

Report of the Eleventh Meeting of the British Association, held at Plymouth, in July, 1841. 8vo. London, 1842.—*From the same.*

Proceedings of the Royal Astronomical Society. Vol. V. No. 21. 8vo. London, 1842.—*From the Society.*

A Comprehensive History of the Iron Trade throughout the World, from the earliest Records to the present Period. By Harry Scrivenor. 8vo. London, 1841.—*From Mr. Jacob Snider, Jr.*

Sixth Census, or Enumeration of the Inhabitants of the United States. Folio. Washington, 1841.—*From the Hon. G. W. Toland.*

Public Documents. Senate, No. 225. House of Representatives, No. 176, No. 683.—*From the same.*

The American Medical Library and Intelligencer. By R. Dunglison, M.D. New Series. Vol. I. No. 11. For May. 8vo. Philadelphia, 1842.—*From the Editor.*

Onzième Rapport Annuel sur les Travaux de la Société d'Histoire Naturelle de l'Ile Maurice. Par M. Louis Bouton, Secrétaire. 8vo. Maurice, 1841.—*From the Society.*

Mémoires de la Société des Antiquaires de l'Amérique du Nord. Partie Linguistique. Par M. Gallatin. Paris, 1842.—*From Mr. Du Ponceau.*

The Twenty-sixth Report of the Directors of the American Asylum, at Hartford, for the Education of the Deaf and Dumb. 8vo. Hartford, 1842.—*From the Directors.*

Second Bulletin of the Proceedings of the National Institution for the Promotion of Science. From March, 1841, to February, 1842. 8vo. Washington, 1842.—*From the Institution.*

Arsberättelse om Framstegen i Fysik och Kemi afgifven den 31 Mars, 1839; af Jac. Berzelius. 8vo. Stockholm, 1840.—*From the Royal Swedish Academy.*

Kongl. Vetenskaps-Academiens Handlingar. För år 1839. 8vo. Stockholm, 1841.—*From the same.*

Arsberättelse om Technologiens Framsteg. Till Kongl. Vetenskaps-Academien afgifven den 31 Mars, 1839; af G. E. Pasch. 8vo. Stockholm, 1840.—*From the same.*

Tal af Academiens Præses, Grefve M. Rosenblad. 8vo. Stockholm, 1840.—*From the same.*

Journal of the Franklin Institute. Third Series. No. 6. For June. Philadelphia, 1842.—*From Dr. Patterson.*

Proceedings of an Indian Council, held at the Buffalo Creek Reservation, State of New York. Fourth Month, 1842. 8vo. Baltimore, 1842.—*From Mr. G. M. Justice.*

Professor Henry, of Princeton, presented the record of a series of experiments on induction from ordinary electricity, as the fifth number of his Contributions to Electricity and Magnetism, which was referred to a Committee. Of these experiments he gave a verbal account, of which the following is the substance.

In the third number of his Contributions he had shown on this subject: 1. That the discharge of a Leyden battery through a conductor developed, in an adjoining parallel conductor, an induced current, analogous to that which, under similar circumstances, is produced by a galvanic current. 2. That the direction of the induced current, as indicated by the polarity given to a steel needle, changes its sign with a change of distance of the two conductors, and also with a change in the quantity of the discharge of electricity. 3. That, when the induced current is made to act on a third conductor, a second induced current is developed, which can again develope another, and so on through a series of successive inductions. 4. That, when a plate of metal is interposed between any two of the consecutive conductors, the induced current is neutralized by the adverse action of a current in the plate.

The direction of the induced currents in all the author's experiments was indicated by the direction of the polarity given to steel needles inclosed in a spiral, the wire of which formed a part of the circuit. But some doubts were reasonably entertained of the true indications of the direction of a current by this means; since M. Savary

had published, in 1826, that, when several needles are placed at different distances above a wire through which the discharge of a Leyden battery is passed, they are magnetized in different directions, and that by constantly increasing the discharge through a spiral, several reversions of the polarity of the contained needles are obtained.

It was, therefore, very important, before attempting further advances in the discovery of the laws of the phenomena, that the results obtained by M. Savary should be carefully studied; and accordingly the first experiments of the new series relate to the repetition of them. The author first attempted to obtain them by using needles of a larger size, Nos. 3 and 4, such as he had generally employed in all his previous experiments; but, although nearly a thousand needles were magnetized in the course of the experiments, he did not succeed in getting a single change in the polarity. The needles were always magnetized in a direction conformable to the direction of the electrical discharge. When, however, very fine needles were employed, he did obtain several changes in the polarity in the case of the spiral, by merely increasing the quantity of the electricity, while the direction of the discharge remained the same.

This anomaly, which has remained so long unexplained, and which at first sight appears at variance with all our theoretical ideas of the connection of electricity and magnetism, was, after considerable study, satisfactorily referred by the author to an action of the discharge of the Leyden jar, which had never before been recognised. The discharge, whatever may be its nature, is not correctly represented (employing for simplicity the theory of Franklin) by the single transfer of an imponderable fluid from one side of the jar to the other; the phenomena require us to admit *the existence of a principal discharge in one direction, and then several reflex actions backward and forward, each more feeble than the preceding, until the equilibrium is obtained.* All the facts are shown to be in accordance with this hypothesis, and a ready explanation is afforded by it of a number of phenomena which are to be found in the older works on electricity, but which have, until this time, remained unexplained.

The same action is evidently connected with the induction of a current on its own conductor, in the case of an open circuit, such as that of the Leyden jar, in which the two ends of the conductor are separated by the thickness of the glass. And hence, if an induced current could be produced in this case, one should also be obtained in that of a second conductor, the ends of which are separated; and

this was detected by attaching to the ends of the open circuit, a quantity of insulated metal, or by connecting one end with the earth.

The next part of the research relates to a new examination of the phenomena of the change in the direction of the induced currents with a change of distance, &c. These are shown to be due to the fact that the discharge from a jar does not produce a single induced current in one direction, but several successive currents in opposite directions. The effect on the needle is principally produced by two of these: the first is the most powerful, and in the adverse direction to that of the jar; the second is less powerful, and in the same direction with that of the jar. To explain the change of polarity, let us suppose the capacity of the needle to receive magnetism to be represented by ± 10, while the power of the first induced current to produce magnetism is represented by -15, and that of the second by $+12$; then the needle will be magnetized to saturation or to -10, by the first induced current, and immediately afterwards all this magnetism will be neutralized by the adverse second induction, and a power of $+2$ will remain; so that the polarity of the needle in this case will indicate an induced current in the same direction as that of the jar. Next, let the conductors be so far separated, or the charge so much diminished, that the power of the first current to develope magnetism may be reduced to -8, while that of the second current is reduced to $+6$, the magnetic capacity of the needle remaining the same. It is evident, then, that the first current will magnetize the needle to -8, and that the second current will immediately afterwards neutralize 6 of this; and consequently the needle will retain a magnetism of -2, or will indicate an induced current in an opposite direction to that of the jar.

In extending the researches relative to this part of the investigation, a remarkable result was obtained in regard to the distance at which inductive effects are produced by a very small quantity of electricity; a single spark from the prime conductor of the machine, of about an inch long, thrown on the end of a circuit of wire in an upper room, produced an induction sufficiently powerful to magnetize needles in a parallel circuit of wire placed in the cellar beneath, at a distance of thirty feet perpendicular, with two floors and ceilings, each fourteen inches thick, intervening. The author is disposed to adopt the hypothesis of an electrical plenum, and from the foregoing experiment it would appear, that the transfer of a single spark is sufficient to disturb perceptibly the electricity of space throughout at least a cube of 400,000 feet of capacity; and, when it is considered

that the magnetism of the needle is the result of the difference of two actions, it may be further inferred, that the diffusion of motion in this case is almost comparable with that of a spark from a flint and steel in the case of light.

The author next alludes to a proposition which he advanced in the second number of his Contributions, namely, that the phenomena of dynamic induction may be referred to the known electrical laws, as given by the common theories of electricity; and he gives a number of experiments to illustrate the connection between statical and dynamical induction.

The last part of the series of experiments relates to induced currents from atmospheric electricity. By a very simple arrangement, needles are strongly magnetized in the author's study, even when the flash is at the distance of seven or eight miles, and when the thunder is scarcely audible. On this principle, he proposes a simple self-registering electrometer, connected with an elevated exploring rod.

Dr. Hare made an oral communication, in continuation of his remarks, made at the last meeting, on platinum and the metals accompanying its native grains.

He stated that, agreeably to trials made by Mr. J. R. Eckfeldt, of the mint, and Mr. Boyè, both possessing balances of exquisite accuracy, and being eminently skilful in the use of them, the specific gravity of a fused globule of iridium of sixty-seven grains in weight, obtained from a warranted specimen of iridium, purchased of Johnson and Cocke, of London, was inferred to be 21.80. Agreeably to this result, and likewise the previous observations of Breithaupt upon certain specimens of native iridium, this metal, either in this state, or as obtained in purity by chemical skill and consolidated by fusion, must be allowed that pre-eminence in density over all other bodies, which, until of late, was conceded to platinum. In fact, as contrasted with platinum, obtained by fusion without subsequent hammering, the difference would be more than one-tenth. Specimens of hammered platinum which weighed 21.23, on fusion were reduced to 19.70.

An important inference from these results was, that, as iridium is the only impurity in standard platinum, a high specific gravity indicates neither a superior degree of purity nor malleability. A piece of standard malleable platinum, of a very fine white colour, presented to Dr. Hare by his excellency Count Cancrine, the Russian minister of finance, as of the best quality of Russian platinum, proved, according to Eckfeldt, to have a specific gravity of 21.31; when a specimen,

purified from iridium agreeably to the instructions of Berzelius, and which had been found pre-eminently susceptible of being beaten into leaf, weighed only 21.16.

On its first fusion, Dr. Hare found the specific gravity of rhodium, 11; precisely what, on examining his books, it was ascertained to have been made by Wollaston. But after it had crystallized superficially, as above described, it was by a magnifier discovered to be minutely porous under the facets. In this state its specific gravity was found by Eckfeldt to be 10.8.

The Committee appointed on the 29th of April, to whom were referred the reports of the Committee of purchase and sale, and of the Committee having charge of the Museum property, presented a report, the consideration of which was postponed to an adjourned meeting, to be held on the first of July next.

Dr. Harlan mentioned that the moulds of the Megalonyx bones, belonging to the Society, cannot now be found, and requested that permission may be accorded to him to have new moulds made at his own expense, under the superintendence of the Curators. On motion, the request of Dr. Harlan was granted.

Adjourned Meeting, July 1.

Present, ten members.

Rev. Dr. BETHUNE in the Chair.

In consequence of the smallness of the meeting, owing to the inclemency of the weather, the Society was adjourned, to meet on Tuesday evening, the 5th instant.

Adjourned Meeting, July 5.

Present, thirty-six members.

Dr. CHAPMAN, Vice-President, in the Chair.

The report of the Committee appointed on the 29th of April was read; whereupon, on motion, the Committee was dis-

charged from the further consideration of the subjects referred to them.

On motion of Mr. S. C. Walker, it was resolved that a Committee of five members be appointed to inquire, and report at the next meeting, concerning the proper course to be pursued for the protection of the principal and accumulation of the trust funds of the Society. Committee, Mr. Walker, Mr. Williams, Mr. T. I. Wharton, Mr. Kuhn, and Mr. G. M. Wharton.

On motion of Dr. Patterson, it was resolved that the Committee on the Museum property be instructed to inquire into the course which, in their judgment, it may be most advisable to take with regard to that property, and that they report to the Society at as early a meeting as practicable.

Stated Meeting, July 15.

Present, thirty members.

Dr. Patterson, Vice-President, in the Chair.

Letters were read—

From Prof. Zantedeschi, of Venice, dated 27th July, 1841, transmitting a copy of his treatise on the Electrotype, and requesting a correspondence with the Society:—

From Laurentius Blanco, of Naples, dated March, 1842, transmitting a copy of his work on the Papyri of Herculaneum.:—

From D. F. Van der Pant, dated 10th May, 1842, presenting Vol. VIII. Part 2, of the Transactions of the Society of Experimental Philosophy of Rotterdam, and giving notice of certain deficiencies in the series of the Transactions of this Society, now in the Library of the Rotterdam Society:—and

From Dr. C. W. Short, of Louisville, Ky., dated 25th May, 1842, stating that he had forwarded a parcel, containing dried specimens of plants of Kentucky, for the Cabinet of the Society.

The following donations were announced:—

FOR THE LIBRARY.

Della Elettrotipia. Memorie di Francesco Zantedeschi. 4to. Venice, 1841.—*From the Author.*

An Engraved Portrait of Mehemet Ali, from a plate produced by the galvanic process.—*From Prof. F. Zantedeschi.*

Astronomical Observations made at the Royal Observatory, Edinburgh. By Thomas Henderson, F. R. S. Vol. IV. for 1838. 4to. Edinburgh, 1841.—*From the Royal Society of London.*

Proceedings of the Royal Astronomical Society. Vol. V. No. 22. 8vo. London, 1842.—*From the Society.*

Discourse delivered before the Historical Society of Pennsylvania, February 21, 1842, on the Colonial History of the Eastern and some of the Southern States. By Job R. Tyson. 8vo. Philadelphia, 1842.—*From the Author.*

The Impropriety of Capital Punishments: or the Report of a Committee on Dr. Cuyler's Sermon, &c. 8vo. Philadelphia, 1842.—*From Job R. Tyson, Esq.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 11, 12, 13 & 14. For February, March, April & May. 8vo. Philadelphia, 1842.—*From the Academy.*

Instructions pour l'Observation des Phénomènes Périodiques. Par A. Quetelet. 8vo. Brussels.—*From the Author.*

Bulletin de l'Académie Royale de Bruxelles. Vol. VIII. Nos. 10, 11 & 12, and Vol. IX. Nos. 1 & 2. 8vo. Brussels, 1841–42. *From the Academy.*

Nouveau Catalogue des Principales Apparition d'Étoiles Filantes. Par A. Quetelet, Secrétaire perpétuel de l'Académie Royale de Bruxelles, &c. 4to. Brussels.—*From the Author.*

Annuaire de l'Observatoire Royale de Bruxelles. Par A. Quetelet, Directeur de cet Établissement. 1842. 9me Année. 12mo. Brussels, 1842.—*From the Author.*

Annuaire de l'Académie Royale des Sciences et Belles Lettres de Bruxelles. 8me Année. 12mo. Brussels.—*From the Academy.*

Bulletin of the Proceedings of the National Institution for the Promotion of Science. Vol. I. No. 1. 8vo. Washington, 1841.—*From the Institution.*

Address delivered at the Anniversary Meeting of the Geological Society of London, on the 18th of February, 1842. By R. I.

Murchison, F. R. S., President of the Society. 8vo. London, 1842.—*From the Author.*

Journal of the Academy of Natural Sciences of Philadelphia. Vol. VIII. Part 2. 8vo. Philadelphia.—*From the Academy.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. New Series, No. 7. For July. 8vo. Philadelphia, 1842.—*From the Editor.*

Nieuwe Verhandelingen van het Bataafsch Genootschap der Proefondervindelijke Wijsbegeerte te Rotterdam. Vol. VIII. Part 2. 4to. Rotterdam, 1842.—*From the Society.*

Epitome dei Volumi Ercolanesi del Cav. Lorenzo Blanco. 12mo. Naples, 1842.—*From the Author.*

Abhandlungen der Mathematisch-Physikalischen Classe der Königlich Bayerischen Akademie der Wissenschaften. Vols. I. & II. and Vol. III. Parts 1 & 2. 4to. Munich, 1832–37–40.—*From the Academy.*

Astronomische Beobachtungen angestellt auf der Königl. Sternwarte zu Bogenhausen von dem ordentlichen Mitgliede der Akademie der Wissenschaften I. Soldner. Parts 2, 3, 4 & 5. 4to. Munich, 1835–36–37–38.—*From the same.*

Observationes Astronomicæ in Specula Regia Monachiensi institutæ, et Regio Jussu publicis impensis editæ a J. Lamont. Vols. VI. VIII. & IX. 4to. Munich, 1834–36–41.—*From the same.*

Ueber das Magnetische Observatorium der Königl. Sternwarte bei München. Von Dr. J. Lamont. 4to. Munich, 1841.—*From the Author.*

Rede zum Andenken an Ignaz Döllinger Dr. in der zur Feier des Allerhöchsten Namens-und Geburtstages Sr. Majestät des Königs am 25 August, 1841, gehaltenen öffentlichen Sitzung der Königl. Bayerischen Academie der Wissenschaften vorgetragen von Dr. Ph. Fr. v. Walther. 4to. Munich, 1841.—*From the Author.*

Journal of the Franklin Institute. Third Series. Vol. IV. No. 1. For July. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

FOR THE CABINET.

A Collection of Dried Plants, made in the State of Kentucky, containing some species, not included in any of the parcels formerly sent by the donor.—*From Dr. Charles W. Short.*

Dr. Patterson stated that he had learned from Mr. Brown, Dragoman to the U. S. legation at Constantinople, that no com-

munication had been received by him in acknowledgment of a donation of coins which he had made to the Society; whereupon, on motion, it was resolved that a duplicate of the usual letter of thanks be transmitted by the Secretaries to Mr. Brown.

The Committee, consisting of Dr. Patterson, Prof. Bache, and Prof. Park, to whom was referred the paper of Prof. Kendall, entitled "Observations on Encke's Comet," &c., reported in favour of its publication in the Society's Transactions; and the publication was ordered accordingly.

Mr. S. C. Walker communicated to the Society the following extract from a letter of Prof. S. Alexander, dated Princeton, N. J., July 14th, 1842, containing the Professor's theory for explaining the remarkable appearance presented by total and annular eclipses of the sun. Prof. A. had taken this early opportunity of laying his views before the Society on a subject which will doubtless cause much speculation in Europe, owing to the occurrence of the remarkable total eclipse of the 7th instant. Prof. A. intended, at some future meeting, to exhibit his reasons in full for the conclusions here announced.

1. If the moon be surrounded by any substance, which can with propriety be termed an atmosphere, the limit of its sensible action upon light will be reduced, in consequence of a permanent terrestrial and anti-terrestrial tide, which will be subject to moderate oscillations of about the same extent with the moon's librations; which tide, however, will preserve a continual accumulation of atmosphere near the point which seems to be the centre of the moon's disc, and that which is diametrically opposite. The elevation of the zone of atmosphere which, in such case, would surround the edge of the disc, must, in consequence, be invariably less than that of almost any other portion. The force of the earth's gravity, tending to produce a tide at the moon's surface, would be more than twenty times as great as that of the moon at the earth's surface, and owing to the feeble gravitation of the moon at her own surface, the same force there would raise a tide some six times as high as at the earth's surface. So that an atmosphere similar to ours would have a tide from the action of the earth about 158 times as high as our atmospheric tides from the action of the moon.

2. Whatever be the constitution of the substance or substances at

the surface of the moon, they exercise an action which at some points deflects, at others inflects, light, producing what (were it not that it cannot at present be asserted that any part of it is due to reflection) might be termed a lunar mirage. In accordance with this general law of action are observed,—the broken cusps, the dark lines, the isolated spots of light of red or other colour, in total and annular eclipses of the sun,—the occasional distortion of planets, the projection of stars upon the moon, and the fact that some of those bodies are not visible at the edge of the moon's disc at emersion, but are first seen at some little distance from it: all of which have been observed in occultations.

3. This action of the moon upon light is *specific;* being more intense in the case of the red ray. Hence many of the phenomena are more readily discernible, when a screen of that colour is employed; though not *altogether invisible*, if the colour of the screen be different. Hence, also, the isolated spots of light, seen during a total eclipse of the sun, are red; and red stars seem to be more frequently projected upon the moon's disc than others.

4. The corona which surrounds the moon during a total eclipse of the sun exhibits—

(*a*) An interior bright edge, which may be due to the action of the moon.

(*b*) Just before the emersion, a well defined portion, which seems to mark a comparative vacuum surrounding the sun.

(*c*) A second portion of more decided density.

(*d*) A rarer portion, exhibiting in some cases decided radiations, which, as has sometimes been supposed, may be the central part of the substance which produces the zodiacal light.

Mr. Boyè mentioned, that Mr. Clark Hare had communicated to him, that, in conjunction with Messrs. Channing and Gibbs, he had succeeded in producing the perchlorate of the oxide of methule, by the same process which Mr. Hare and Mr. Boyè himself had employed for producing the perchlorate of the oxide of ethule; namely, the distillation of the dry sulphomethylate of baryta and perchlorate of baryta.

This compound resembles, in its general properties, the perchlorate of the oxide of ethule, being a colourless liquid, heavier than water, and exploding with great violence on being touched by an ignited body. The force of its explosion seemed, however, less than that of the corresponding compound of ethule; nor did it appear capable of

being ignited by friction or percussion. It was sweet to the taste, but possessed a pungency which in a short time became painful, and attacked the skin of the tongue, so as to destroy the power of tasting, and to leave the surface white for several days afterwards.

Mr. Boyè remarked that, when the perchlorate of ethule was discovered, the quantity of permanent gases generated by its explosion, and the extreme force with which it scattered the pieces of the vessel in which it was contained, had suggested to him the idea of employing it as an explosive agent, and he had designed making some experiments on this subject, by mixing it with small portions of other substances; but finding it perfectly unmanageable, he had abandoned the attempt. The fact that the perchlorate of methule is not explosive spontaneously, or by friction or percussion, suggested a similar idea; principally as this substance contains more oxygen than is necessary for its own combustion, and, therefore, would probably permit still better the admixture of other combustible liquids, so as to control its explosive force, and abate it so far as to render it applicable to purposes of projection. The advantages of such a liquid over common gunpowder would be, in the first place, that it would yield a much greater amount of gaseous matter; secondly, being a liquid, the whole mass would explode at once, while in common gunpowder a portion of the grains are thrown out without being ignited; and, thirdly, being entirely convertible into gases, it would leave no solid residue, which is a great inconvenience with ordinary gunpowder.

Mr. B. further remarked that, in their paper on the perchlorate of ethule, Mr. Clark Hare and himself had expressed the opinion, that, in explosive violence, it was not equalled by any substance known in chemistry; for, although they had never had occasion to compare it directly with the chloride of nitrogen, there was one point in which it evidently much surpassed that substance; namely, the great distance to which its explosion was perceptible, and the force with which it projected the fragments of the containing vessel. Minute pieces of glass might be seen, where it struck the glass plates of the screen, to have been converted into minute heaps of a compressed powder, protruding above the surface of the glass, under which, on removing the powder, a dent appeared. In order to form a more distinct idea of its power, Mr. B. had calculated the volume of gas given off by the perchlorates of ethule and methule, by chloride of nitrogen, and by gunpowder; from which it appears, that, when the temperature to which the gases are raised by the explosion is assumed to be 1000° centigrade, or 1832 Fahrenheit, which is a little lower than the heat

in the white part of flame, the perchlorate of ethule will yield a volume of gas $2\frac{2}{3}$ times as great as that yielded by an equal weight of gunpowder, and $2\frac{1}{3}$ times the amount yielded by chloride of nitrogen; while, if the explosion be supposed to take place in a vessel of the exact capacity of the substance, and strong enough to withstand the pressure exercised against its sides, this pressure would be with gunpowder 1566 atmospheres, with chloride of nitrogen 2852, and with perchlorate of ethule (the specific gravity of this latter being assumed to be 1.4) 5648; or the latter would be $3\frac{2}{3}$ times that of gunpowder, and twice that of chloride of nitrogen.

Names of the Substances.	Oxygen per cent.	Vol. of gases in cub. centim. at 0° centigr. yielded by one gramme of the substance.*	Composition of the mixture of resulting gases, after explosion, in volumes.	Sp. gr. of the mixture at 0°.	Vol. of gases in cubic centim. at 1000° centigr. yielded by one gramme of the substance.	Same vol. of gas expressed by the bulk of the substance as unity.†	Relative proportions of the numbers in the preceding column.
Gunpowder	35.5	330	3 vol. Carb. acid, 1 ,, Nitrogen.	1.39	1536	1566‡	1.
Chloride of nitrogen		371	3 vol. Chlorine, 1 ,, Nitrogen.	2.07	1726	2852	1.8
Perchlorate of methule	55.8	682	2 vol. Carb. acid, 2 ,, Steam, 2 ,, Chlorohyd. acid, 1 ,, Oxygen.	1.41	3170	4438§	2.8
Perchlorate of ethule	49.7	868	4 vol. Carb. oxide, 4 ,, Steam, 2 ,, Chlorohyd. acid.	0.89	4034	5648§	3.6

* The steam is here, for convenience, considered not to condense, but to contract regularly from 100° to 0° as a permanent gas.

† This number also expresses the pressure in atmospheres at the moment of explosion.

‡ Gunpowder is here assumed to have the specific gravity of 1.02, as given in Ure's Dictionary, and to have the usual composition of 75 per cent. of nitre. An experiment with Dupont's best Eagle powder, when well shaken together by tapping on the outside of the vessel, gave the specific gravity of 1.055. An analysis of it yielded nitre 77.28, carbon 12.58, sulphur 10.14. It lost by desiccation, in vacuo over sulphuric acid, 0.86 per cent. of hygroscopic moisture, and yielded 0.87 per cent. of ashes, of a bright reddish colour from its carbon.

§ The specific gravity of the perchlorates of the oxides of methule and ethule is unknown, but is assumed to be 1.4, as they are much heavier than water.

The differences will be still more striking, if it be further assumed, that the projective force is not only dependent on the pressure at the time of the explosion, but also on the specific gravity of the gases, or what may be termed their energy; and that, in regard to gunpowder, this effect is considerably lessened by the fact, that, when the explosion takes place in a vessel that yields before the maximum force is attained, a considerable proportion of the powder is thrown out before it can act or be ignited; while, with liquids, the ignition of the whole mass is instantaneous. Mr. B. had no doubt that, in this respect, the force of the perchlorate of the oxide of ethule might be considered more than ten times as great as that of gunpowder. It would also be evident from these considerations, that, in this same respect, the chloride of nitrogen, although considerably inferior to the perchlorates, still greatly surpasses gunpowder; and that a prevalent opinion to the contrary must be founded in a deception, probably arising from the smallness of the quantities of this dangerous substance which can be employed with safety in experiments.

The Committee appointed at the adjourned meeting of the 5th of July, to report in relation to the proper course to be pursued for the protection of the trust funds of the Society, made a report, which was recommitted to the same Committee, with instructions to report at an adjourned meeting, to be held on Friday evening next.

The following gentlemen were elected members of the Society:—

Petty Vaughan, of London.

Frederick Fraley, of Philadelphia.

Adjourned Meeting, July 22.

Present, thirty-five members.

Dr. Patterson, Vice-President, in the Chair.

The report of the Committee on the Museum property, under the resolution passed at the adjourned meeting of the 5th of July, was read, and the Society adopted the recommendations contained therein; namely, that the several instru-

ments of writing, indicated in the report as necessary for carrying into effect the purchase of the Museum property, and for concluding with the Philadelphia Museum Company and with Nathan Dunn, the agreements relative to the occupation of parts of the Museum building, be executed by the President in due form.

On motion of Mr. T. I. Wharton, the Committee on the trust funds of the Society was continued.

Prof. Bache read a communication, in relation to the balance due by the Society for the expenses of the Magnetic Observatory. This communication was referred to the Committee on the trust funds.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. AUGUST, SEPT. & OCT., 1842. No. 23.

Stated Meeting, August 19.

Present, twenty-seven members.

Mr. DU PONCEAU, President, in the Chair.

Mr. Fraley, a member elect, was presented to the President, and signed the laws.

Letters were read:—

From the Baron de Ladoucette, dated Paris, 19th March, 1842, acknowledging the honour of his election as a member:—

From the Baron de Ladoucette, dated Paris, 5th May, 1842, Count Gräberg de Hemsö, dated Florence, 30th May, 1842,— the Hon. J. R. Ingersoll, dated Washington 13th July, 1842, and the Dutch Society of Sciences at Harlem, dated 28th July, 1842, severally announcing the transmission of donations to the Library:—

From Dr. Harlan, dated 19th Aug. 1842, announcing the return of the fossil bones of the Megalonyx, borrowed by him from the Society some time since, and requesting that his paper on the Orycterotherium Missouriense might be returned to him:—and

From Mr. Picot, consul of France, dated 19th Aug. 1842, inviting the Society to attend the funeral services in honour of H. R. H. the late Duke of Orleans, on the 26th instant.

On motion, the request contained in Dr. Harlan's letter was granted.

The invitation to attend the funeral services in honour of the Duke of Orleans was accepted.

The following donations were announced:

FOR THE LIBRARY.

Catalogue of the Officers and Students in Yale College, 1841–2. 8vo. New Haven, 1841.—*From the College.*

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia, for May, June and July, 1842. Vol. I. No. 3. 8vo. Philadelphia, 1842.—*From the College.*

The American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 12. For June, 1842. 8vo. Philadelphia, 1842.—*From the Editor.*

Ueber die Himjaritische Sprache und Schrift von Dr. Wilhelm Gesenius. 8vo. 1841.—*From the Author.*

Address delivered by B. A. Bidlack, on the 22d Feb. 1839, at Wilkesbarre, Penn. 8vo. Washington, 1842.—*From the Author.*

Statistics of the United States of America. Collected under the Thirteenth Section of the Act for taking the Sixth Census. Published by Authority. Folio. Washington, 1841.—*From the Hon. J. R. Ingersoll.*

Bulletin de la Société de Géographie. Second Series. Vol. XVI. 8vo. Paris, 1841.—*From the Society.*

Journal de Pharmacie et de Chimie. New Series. Vol. I. Nos. 2, 3, 4 & 5. 8vo. Paris, 1842.—*From the Editors.*

Annales des Mines. Third Series. Vol. XX. No. 5. 8vo. Paris, 1841.—*From the Council of Mines.*

Journal Asiatique, ou Recueil de Mémoires, d'Extraits et de Notices relatifs à l'Histoire, à la Philosophie, etc. Third Series. Vol. XII. No. 69, and Vol. XIII. Nos. 70 & 71. 8vo. Paris, 1841–42.—*From the Society.*

Fables de J. C. F. Ladoucette. Seconde Édition. 8vo. (Two copies.) Paris, 1842.—*From the Author.*

Notice sur la Vie et sur les Travaux de M. le Baron de Ladoucette, député de la Moselle. 8vo. Paris, 1842.—*From the Baron de Ladoucette.*

Recueil des Travaux de la Société d'Amateurs des Sciences, de l'Agriculture et des Arts, à Lille. Années 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, et 1er Semestre de 1827. Four volumes. 8vo. Lille.—*From the Society.*

Séances Publiques de la Société d'Amateurs des Sciences et des Arts,

à Lille. No. 4, 1811, & No. 5, 1819. 8vo. Lille.—*From the Society.*

Mémoires de la Soeiété Royale des Seienees, de l'Agrieulture et des Arts, à Lille. 2e Semestre de 1827, et Années 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, et 1841. Fourteen volumes. 8vo. Lille.—*From the Society.*

Observations Authentiques sur la Peste du Levant, et sur la Vertu spécifique de l'Huile d'Olive contre eette effrayante Maladie. Par J. Grâberg de Hemsö. 8vo. Florenee, 1841.—*From the Author.*

Notiee sur la Race de Dromadaires existant dans le Domaine de San Rossore, près de Pise en Toseane. Par Jaeques Grâberg de Hemsö. 8vo. Paris, 1840.—*From the Author.*

Degli Ultimi Progressi della Geografia Sunto Letto pel Conte Cavaliere Jaeopo Grâberg da Hemsö, Dottore di Filosofia e Belle Lettere, &e. 8vo. Milan. 1841.—*From the Author.*

Relazioni Commerciali dell'Egitto dell'Isola di Candia, e della Siria coi Porti dell'Italia e prineipalmente eon quello di Livorno. 8vo. Florence, 1841.—*From Count Graberg de Hemsö.*

Sunto della Litteratura Svezzese in questi Ultimi Anni eioè fino all' Epoea, del Viaggio del Sig. Marmier gia'dettato nell'anno 1833, ma ora reveduto, eorretto, e formito di giunte dal Conte Cav. Dottore Jaeopo Grâberg da Hemsö. 8vo. Florenee, 1841.—*From the Author.*

The Ninth Annual Report of the Royal Cornwall Polyteehnic Society. 8vo. Falmouth, 1841.—*From the Society.*

Natuurkundige Verhandelingen van de Hollandsehe Maatsehappij der Wetensehappen te Haarlem. Vol. I. Part II. 4to. Harlem, 1841.—*From the Society.*

Journal of the Franklin Institute. Third Series. Vol. IV. No. 2. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Prineiples of General and Comparative Physiology. By William B. Carpenter, M.D. 8vo. London, 1841.—*From the Author.*

Prineiples of Human Physiology, with their ehief Applieation to Pathology, Hygiène, and Forensie Medieine. By William B. Carpenter, M.D. 8vo. London, 1842.—*From the Author.*

Tie Douloureux, or Neuralgia Faeialis, and other Nervous Affections; their Seat, Nature and Cause: with Cases illustrating sueeessful Methods of Treatment. By R. H. Allnatt, M.D. 8vo. London, 1841.—*From the Author.*

Académie Royale des Scienees de Turin. Programme des Prix fon-

dés par M. le Comte Pillet-Will, associé correspondant de l'Académie. Turin.—*From the Academy.*

Accademia Reale delle Scienze di Torino. Classe delle Scienze Morali, Storiche e Filologiche, Programma. Turin.—*From the Academy.*

Public Documents (Senate). Second Session, Twenty-seventh Congress, No. 336. Invention for preventing Explosions of Steamboilers. Washington.—*From Prof. Walter R. Johnson.*

Notizie sulla Moltiplicazione in Firenze negli anni 1837, 1838, 1839, dell'Uccello Americano Paroaria Cucullata chiamato volgarmente Cardinale. Da Carlo Passerini. Folio. Florence, 1841.—*From the Author.*

Éloge Historique de M. Livingston. Par M. Mignet. Lu à l'Institut Royale de France, à la Séance publique du 30 Juin, 1838. 8vo. Paris, 1838.—*From Mr. Du Ponceau.*

FOR THE CABINET.

A Fac Simile of the engrossed Copy of the Declaration of Independence.—*From the Department of State, through the Hon. J. R. Ingersoll.*

Dr. Bache, Reporter, announced the publication of Nos. 21 and 22 of the Proceedings of the Society.

Dr. Patterson announced the death of Professor John Patton Emmet, of the University of Virginia, a member of the Society, on the 13th of Aug. 1842, aged 46 years, and gave a brief notice of his character and services.

The Committee on the Museum property presented the several papers and documents, necessary to carry into effect the purchase of the property, duly executed under the instructions of the Society, given at the last meeting.

On motion, it was resolved, that the Committee on the trust funds be charged with the duty of conferring with the Committee of Councils, in relation to the advance made by the city to a fund for constructing an Astronomical Observatory.

Stated Meeting, September 16.

Present, thirty-five members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Imperial Academy of Naturalists at Moscow, dated 8th May, 1842, and the Literary and Philosophical Society of Manchester, dated 24th May, 1842, announcing the transmission of donations to the Library:—

From the Prince of Canino, dated Florence, 29th July, 1842, referring to the meeting of sçavans to be held at Lucca in 1843, and to other matters of scientific interest.

The following donations were announced:—

FOR THE LIBRARY.

American Medical Library and Intelligencer. By Robley Dunglison, M.D. New Series. Vol. I. No. 13. Supplement. 8vo. Philadelphia, 1842.—*From the Editor.*

Memoirs of the Literary and Philosophical Society of Manchester. Second Series. Vol. VI. 8vo. London, 1842.—*From the Society.*

Twenty-fifth Annual Report of the London Provident Institution, to the 20th Nov. 1841. London.—*From William Vaughan, Esq.*

Classification of the Trades, Occupations, Business and Callings of the Depositors of the London Provident Institution. London.—*From the same.*

Proceedings of the Royal Astronomical Society. Vol. V. Nos. 23 & 24. 8vo. London, 1842.—*From the Society.*

Proceedings of the Royal Society of Edinburgh. Nos. 1 to 12 inclusive, and Nos. 19 & 20. 8vo. Edinburgh.—*From the Society.*

Transactions of the Royal Society of Edinburgh. Vol. XV. Part II. 4to. Edinburgh, 1842.—*From the Society.*

Philosophical Transactions of the Royal Society of London. For the Year 1842. Part I. 4to. London, 1842.—*From the Society.*

Proceedings of the Royal Society. Nos. 50, 51, 52 & 53. London, 1841-42.—*From the Society.*

Royal Society. Proceedings of the Committee of Physics, including Meteorology. Nos. 1, 2 & 3. London.—*From the Society.*

Catalogue of the Miscellaneous Literature in the Library of the Royal Society. 8vo. London, 1841.—*From the Society.*

An Address on the early Settlement of the Valley of Pequea. By Redmond Connyngham. Delivered at the Lyceum Celebration, 4th July, 1842, at Paradise.—*From the Author.*

Statistics of the United States of America, as collected under the Thirteenth Section of the Act for taking the Sixth Census. Published by Authority. Folio. Washington, 1841.—*From the Hon. G. W. Toland.*

Some Remarks on the Ancient Peruvians. By S. G. Morton, M.D. *From the Author.*

Remarks on the so called Pigmy Race of the Valley of the Mississippi. By S. G. Morton, M.D.—*From the Author.*

Description of some new Species of Organic Remains of the Cretaceous Group, &c. By S. G. Morton, M.D.—*From the Author.*

An Inquiry into the Distinctive Characteristics of the Aboriginal Race of America. Read at the Annual Meeting of the Boston Society of Natural History, April 27, 1842. By S. G. Morton, M.D. 8vo. Boston, 1842.—*From the Author.*

Catalogue of Skulls of Man and the Inferior Animals, in the Collection of S. G. Morton, M.D.—*From Dr. Morton.*

Description of some new Terrestrial and Fluviatile Shells of North America. By Thomas Say. 8vo. New Harmony, 1840.—*From the same.*

Descriptions of New Species of Quadrupeds inhabiting North America. By J. J. Audubon and the Rev. John Bachman, D.D.—*From the Authors, through Dr. Morton.*

Compendium of the Enumeration of the Inhabitants and Statistics of the United States, from the Returns of the Sixth Census. To which is added an Abstract of each preceding Census. Prepared at the Department of State. Folio. Washington, 1841.—*From the Hon. J. R. Ingersoll.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Pais. No. 7. 8vo. Valencia, 1842.—*From the Society.*

Iconografia della Fauna Italica di Carlo Luciano Bonaparte, Principe di Canino e Musignano. Parts XVI. to XXIX. inclusive. Folio. Rome, 1836–40.—*From the Author.*

Bulletin de la Société Impériale des Naturalistes de Moscou. Vol. XIV. Nos. 2, 3 & 4, and Vol. XV. No. 1. 8vo. Moscow, 1841–42.—*From the Society.*

Revue des Fossils du Gouvernment de Moscou. Par G. Fischer de Waldheim. 8vo. Moscow, 1842.—*From the Author.*

Journal de Pharmacie et de Chimie. Third Series. Vol. I. No. 6. 8vo. Paris, 1842.—*From the Editors.*

Journal of the Franklin Institute. Third Series. Vol. IV. No. 3. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Prof. Bache read a paper, entitled "Observations on the Magnetic Dip, made in the United States in 1841, by J. N. Nicollet," which was referred to a Committee.

Mr. Lea exhibited specimens of rock masses, brought by Lieut. Rich of the U. S. Navy, from Payta in Peru, and from the Bay of Coquimbo in Chili.

Mr. Lea drew the attention of the Society particularly to the former, which was interesting chiefly from the fact of its tending to illustrate the theory of "existing causes." The rock from which this specimen was taken is a compact sandstone, composed of minute grains of quartz, cemented by carbonate of lime, and perforated by *Lithodomi* or Boring Mollusca, being identical with the species now inhabiting the neighbouring sea coast, and consisting of *Petricola solida*, *P. denticulata*, *Lithophagus dactylus*, &c. The included shells are in nearly a perfect state.

The elevation above the level of the sea from which this specimen was taken, as stated by Lieut. Rich, is nearly two hundred feet, which is remarkable, as the elevation of the coast by the earthquake of 1822, as mentioned by Mrs. Graham, was but a few feet, and that of 1835, as stated by Capt. Fitz Roy, being but about eight feet.

From the appearance of the specimen there can scarely be a doubt but that it formed part of the shelving shore of the sea in a softer state, into which the Lithodomi made their requisite foramina.

The second specimen consists chiefly of a single valve of a large *Ostrea*, probably from the lower tertiary, and remarkable for its great size, its length being about twelve inches, and its breadth eight inches.

Mr. Kane announced the decease of Mr. Isaac Rand Jackson, a member of this Society, at Copenhagen, on the 27th of July, at the age of thirty-seven.

On motion of Mr. S. C. Walker, Mr. Kane was requested to prepare an obituary notice of the deceased.

Dr. Bache announced the decease of Baron Larrey, a member of this Society, on the 24th of July, 1842, aged seventy-six.

On motion of Dr. Patterson, Mr. Kuhn was appointed on the Committee of Finance, to fill the vacancy caused by the death of Mr. Nicklin.

Stated Meeting, October 7.

Present, twenty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From Mr. Petty Vaughan, dated London, 2d Sept. 1842, acknowledging the honour done him by his election as a member of this Society:—

From the Zoological Society of London, dated 2d July, 1842, and the Linnean Society of London, dated 18th July, 1842, severally acknowledging the reception of copies of the Transactions and Proceedings of this Society:—

From the Society of Antiquaries of London, dated 21st June, 1842, announcing the transmission of the twenty-ninth volume of the Archæologia:—

From Major Graham, dated Washington, 28th August, 1842, presenting a series of maps and charts, illustrating the demarcation of a portion of the boundary between the United States and Texas, and a chart of the entrance of the river Sabine:—

From Mr. William Cogswell, Corresponding Secretary of the Northern Academy of Arts and Sciences, of Hanover, N. H. dated 18th Dec. 1841, requesting the donation of the publications of this Society:—and

From Colonel Todd, American minister at St. Petersburg, dated 13th April, 1842, enclosing a letter received by him from his Excellency Count Canerine, Minister of Finances of Russia, placing at Colonel Todd's disposal, two copies of Kupffer's work on weights and measures, one of which he presents to this Society.

On motion, the Society directed that a copy of the Proceed-

ings be regularly sent to the Academy of Arts and Sciences at Hanover, and that acknowledgments be made by the Secretary to Colonel Todd and Count Cancrine for the donation, received this evening, of Kupffer's work on Weights and Measures.

The following donations were announced:—

FOR THE LIBRARY.

Travaux de la Commission pour fixer les Mesures et les Poids de l'Empire de Russie. Rédigés par A. Th. Kupffer, Membre de cette Commission et Académicien. Two volumes, quarto, with a folio volume of Plates. St. Petersburg, 1841.—*From his Excellency Count Cancrine, Russian Minister of Finances, through Colonel Todd, American Minister at St. Petersburg.*

Archæologia, or Miscellaneous Tracts relating to Antiquity. Published by the Society of Antiquaries of London. Vol. XXIX. 4to. London, 1842.—*From the Society.*

The Transactions of the Linnean Society of London. Vol. XIX. Part I. 4to. London, 1842.—*From the Society.*

List of the Linnean Society. 1842.—*From the Society.*

Proceedings of the Linnean Society. No. 14.—*From the Society.*

Proceedings of the Geological Society of London. Nos. 77 to 83 inclusive.—*From the Society.*

Proceedings of the Royal Society. No. 54.—*From the Society.*

Astronomical and Magnetical and Meteorological Observations, made at the Royal Observatory, Greenwich, in the Year 1840: under the direction of George Biddell Airy, Esq. M.A., Astronomer Royal. 4to. London, 1842.—*From the Royal Society.*

Transactions of the Zoological Society of London. Vol. III. Part I. 4to. London, 1842.—*From the Society.*

Proceedings of the Zoological Society of London. Nos. 96 to 107 inclusive. 8vo. London, 1841.—*From the Society.*

Reports of the Council and Auditors of the Zoological Society of London, April 29, 1842. London, 1842.—*From the Society.*

Transactions of the Society instituted at London for the Encouragement of Arts, Manufactures and Commerce. Vol. LIII. Part II. 8vo. London, 1841.—*From the Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 15 & 16. 8vo. Philadelphia, 1842.—*From the Academy.*

Ueber die Lais, Sequenzen und Leiche. Ein Beitrag zur Geschichte der Rhythmischen formen und Singweisen der Volkslieder und

der Volksmässigen Kirchen-und Kunstlieder im Mittelalter. Von Ferdinand Wolf. 8vo. Heidelberg, 1841.—*From the Author.*

Notice sur l'Eurypterus de Podolie et le Chirotherium de Livonie, par G. Fischer de Waldheim, Dr. en Philosophie, etc. 4to. Moscow, 1839.—*From the Author.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. New Series. No. 8. For October, 1842. 8vo. Philadelphia, 1842.—*From the Editor.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. Costa, etc. 4to. Paris, 1826.—*From Mr. D. B. Warden.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. Sérullas, etc. 4to. Paris, 1829.—*From the same.*

Académie Royale des Sciences. Exposé des Recherches pour déterminer les Forces élastiques de la Vapeur d'Eau à de hautes Températures. 4to. Paris, 1830.—*From the same.*

Académie Royale des Sciences. Rapport sur un Mémoire de M. le Baron de Morogues, etc. 4to. Paris, 1832.—*From the same.*

Comparison des Formes crystallines de la Strontiane carbonatée avec celles de l'Arragonite. Par M. Haüy. 4to. Paris.—*From the same.*

Nouvelles Observations sur la Faculté conservatrice de l'Électricité acquise à l'aide du Frottement. Par M. Haüy. 4to. Paris.—*From the same.*

Observations sur la Simplicité des Lois auxquelles est soumise la structure des Cristaux. Par M. Haüy. Paris.—*From the same.*

Description d'une Nouvelle Variété d'Amphibole. Par M. Haüy. 4to. Paris.—*From the same.*

Sur les Cymophanes des États-Unis. Par M. Haüy. Paris.—*From the same.*

Sur l'Usage des Caractères physiques des Minéraux, pour la distinction des Pierres précieuses qui ont été taillées. Par M. Haüy. 4to. Paris —*From the same.*

Institut Royal de France. Annuaire, 1842. 12mo. Paris, 1842. *From the same.*

Expédition au Pôle Antarctique des Corvettes l'Astrolabe et la Zélée, sous le Commandement de M. Dumont d'Urville. 8vo. Paris, 1840.—*From the same.*

Rapport sur les Travaux de la Société Royale et Centrale d'Agriculture, depuis sa Séance publique de 26 Avril, 1841. Par M. Soulange Bodin. 8vo.—*From the same.*

De la Plantation du Melèze (Pinus larix), d'après des Observations faites en Ecosse. 8vo.—*From the same.*

Conseils aux Nouveaux Éducateurs de Vers à Soie. Par M. Frédéric de Boullenois. 8vo. Paris, 1842.—*From the same.*

Rapport sur une Proposition faite au Gouvernement par M. de Lasteyrie. Par le Secrétaire perpétuel, G. Cuvier. 1er Février, 1813. Folio.—*From the same.*

A lithographic plate, entitled "Mosaïque découverte le 24 Octobre, 1831, dans une Maison de Pompéi, dite la Maison du Faune."—*From the same.*

Map of the River Sabine from Logan's Ferry to 32d degree of North Latitude, showing the Boundary between the United States of America and the Republic of Texas between said Points.—*From Major Graham, U. S. Topog. Engineers.*

Part of the Boundary between the United States and Texas, from Sabine River, northward, to the 36th mile Mound.—*From the same.*

Part of the Boundary between the United States and Texas, North of Sabine River, from the 39th to the 72d mile Mound.—*From the same.*

Part of the Boundary between the United States and Texas, North of Sabine River, from the 72d mile Mound to Red River.—*From the same.*

Sabine Pass, and Mouth of the River Sabine in the Sea. Surveyed, under the direction of Major J. D. Graham, U. S. Topog. Engineers, by Lieut. T. J. Lee, Topog. Engineers, and Capt. P. J. Pillans, Texan Army.—*From the same.*

Map of the River Sabine, from its Mouth on the Gulf of Mexico, in the Sea, to Logan's Ferry, in Latitude 31° 58′ 24″ north. Showing the Boundary between the United States and the Republic of Texas.—*From the same.*

Mr. Kane, pursuant to the order of the Society at its last meeting, presented an obituary notice of the Hon. Isaac Rand Jackson.

Mr. Jackson was born at Newburyport, Massachusetts, where his family had resided for many years. After receiving an education in the public schools of Massachusetts, to which he added largely by assiduous private study, he engaged for a short time in merchandise. His health, however, led him to visit Europe soon after he had reached manhood, and he spent some years there in the cultivation of the refined tastes by which he was afterwards distinguished. On his return, he studied law under Chief Justice Cranch of the District of Co-

lumbia, and was admitted to the bar of Washington and that of Philadelphia.

But the law was for him an accomplishment, rather than a profession. He devoted himself more fully to general science and elegant literature, and found congenial relaxation in the study of the arts. An ample fortune facilitated these pursuits. He surrounded himself with choice pictures and statuary, a fine cabinet of medals and coins, a collection of minerals more extensive perhaps in the number of specimens than any other in the United States, and an exceedingly valuable library.

He was not, however, a mere collector. His books, though remarkable some of them for their antiquity and rarity, were not things for show. To the standards of English and continental literature, he added all the latest productions of value as they issued from the press: he received these regularly, and sifted them himself before assigning them a place on his shelves. The descriptive catalogue of his minerals, which includes more than 12,000 specimens, classified upon the basis of Cleaveland's system, each compared with the original type and its characteristics indicated, is a monument of his scientific labour. The preparation of it engaged his leisure, between midnight and two o'clock, for several years.

Indeed, all his habits showed the man of regulated industry. Almost engrossed occasionally by the cares of his estate during the day,—sharing zealously and effectively in the political discussions of the times,—mastering successively the French, Italian, Spanish, and German languages,—and keeping himself in the advance among the students of natural science,—he had always his hours of leisure for an enlarged correspondence, and for ample hospitality.

He became a member of the Society in April, 1841. He had shortly before accepted from General Harrison the post of Chargé d'Affaires at Copenhagen, and in August of that year he sailed for Denmark. He had scarcely become domiciliated in his diplomatic residence, and was just renewing some researches which he had begun at home into the antiquities of the North, when death met him on the 27th of July, 1842, at the early age of thirty-seven.

Dr. Patterson read a paper on the "Integration of Irrational Functions, by Pike Powers," which was referred to a Committee.

A paper, consisting of extracts from a mathematical commonplace book, was read, and referred to a Committee.

Dr. Hare communicated to the Society, a summary of his objections to the arguments in favour of the existence, in the amphide salts, of compound radicals analogous to cyanogen.

Dr. Hare stated, that the success which had been conceived to attend the inferences lately made, respecting the existence of compound radicals in various interesting organic substances, had led some distinguished chemists to suppose that the salts heretofore believed to consist of acids and bases, might consist of a compound halogen body or "salt radical," with a metal or with hydrogen.

Having given to the facts and arguments advanced in favour of this new doctrine the most sedulous consideration, Dr. Hare declared himself to have arrived at the conviction that it was susceptible of being refuted.

Accordingly, he had prepared an essay which it was hoped would be found to justify the view of the question which he had taken. He did not, however, deem it proper to take up the time of the Society by entering into the subject fully in a verbal communication; he would only submit a summary of the opinions which he hoped to justify in the essay which he intended to publish.

(*a*) The community of effect, as respects the extrication of hydrogen by contact of certain metals with aqueous solutions of sulphuric and chlorohydric acid, is not an adequate ground for an inferred analogy of composition; since it must inevitably arise that any radical will, from any compound, displace any other radical, when the forces favouring its substitution preponderate over the quiescent affinities:—

(*b*) But if, nevertheless, it be held that the evolution of hydrogen from any combination, by contact with a metal, is a sufficient proof of the existence of a halogen* body, simple or compound, in the combination, the evolution of hydrogen from water, by the contact with any metal of the alkalies, must prove oxygen to be a halogen body; also the evolution of hydrogen from sulphydric, selenhydric, or tellurhydric acids, by similar means, would justify an inference that sulphur, selenium and tellurium, as well as oxygen, belong to the halogen or salt radical class:—

(*c*) The amphigen bodies being thus proved to belong to the halogen class, oxides, sulphides, selenides, and tellurides, would be haloid salts, and their compounds double salts, instead of consisting of a compound radical and a metal:—

* The epithet halogen is applied to bodies whose binary compounds with metals are deemed salts, and which are consequently called haloid salts.

(*d*) The argument in favour of similarity of composition in the haloid and amphide salts,* founded on a limited resemblance of properties in some instances, is more than counterbalanced by the extreme dissimilitude in many others:—

(*e*) As, in either class, almost every property may be found which is observed in any chemical compound, the existence of a similitude, in some cases, might be naturally expected:—

(*f*) As it is evident that many salts, perfectly analogous in composition, are extremely dissimilar in properties, it is not reasonable to consider resemblance in properties, as a proof of analogy in composition:—

(*g*) No line of distinction, as respects either properties or composition, can be drawn between the binary compounds of the amphigen and halogen bodies, which justifies that separate classification which the doctrine requires; so that it must be untenable as respects the one or be extended to the other:—

(*h*) The great diversity, both as respects properties and composition of the bodies called salts, rendering it impossible to define the meaning of the word, any attempt to vary the language and theory of Chemistry, in reference to the idea of a salt, must be extremely pernicious:—

(*i*) There is at least as much mystery in the fact that the addition of an atom of oxygen to an oxacid, should confer an affinity for a simple radical, as that the addition of an atom of this element to such a radical, should create an affinity between it and an oxacid:—

(*j*) If one atom of oxygen confer upon the base into which it enters, the power to combine with one atom of acid, it is quite consistent that the affinity should be augmented, proportionably, by a further accession of oxygen:—

(*k*) It were quite as anomalous, mysterious, and improbable, that there should be three oxyphosphions, severally requiring for saturation one, two, and three atoms of hydrogen, as that three isomeric states of phosphoric acid should exist, requiring as many different equivalents of basic water:—

(*l*) The attributes of acidity alleged to be due altogether to the presence of basic water, are not seen in hydrated acids, when holding water in that form only; nor in such as are, like the oily acids, inca-

* An amphide salt is one consisting of an acid and a base, each containing an amphigen body, either oxygen, sulphur, selenium, or tellurium, as its electro-negative ingredient.

pable of uniting with water as a solvent. Further, these attributes are admitted to belong to salts which, not holding water as a base, cannot be hydrurets or hydracids of any salt radical: and while such attributes are found in compounds which, like chromic and carbonic acid, cannot be considered as hydrurets, they do not exist in all that merit this appellation, as is evident in the cases of prussic acid and oil of bitter almonds:—

(*m*) It seems to have escaped attention, that if SO^4 be the oxysulphion of sulphates, SO^3, anhydrous sulphuric acid, must be the oxysulphion of the sulphites; and that there must, in the hyposulphites and hyposulphates, be two other oxysulphions!—

(*n*) The electrolytic experiments of Daniell have been erroneously interpreted; since the electrolysis of the base of sulphate of soda would so cause the separation of sodium and oxygen, that the oxygen would be attracted to the anode, the hydrogen and soda being *indirectly* evolved by the reaction of sodium with water; while the acid deprived of its alkaline base, would be found at the anode in combination with basic water, without having been made to act in the capacity of an anion:—

(*o*) The copper, in the case of a solution of the sulphate of this metal and a solution of potash, separated by a membrane, would, by electrolyzation, be evolved by the same process as sodium, so long as there should be copper to perform the office of a cathion; and when there should no longer be any copper to act in this capacity, the metal of the alkali, or hydrogen of water, on the other side of the membrane, would act as a cathion; the oxygen acting as an anion from one electrode to the other, first to the copper, and then to the potassium:—

(*p*) The allegation that the copper was deposited from the want of an anion (oxysulphion) to combine with, is manifestly an error; since, had there been no anion, there could have been no discharge, as alleged, to hydrogen as a cathion, nor any electrolysis:—

(*q*) The hydrated oxide precipitated on the membrane came from the reaction of the alkali with the sulphate of copper; the precipitated oxide of this metal from the oxygen of the soda acting as an anion; and the deposite of metallic copper from the solutions performing, feebly, the part of electrodes, while themselves the subjects of electrolyzation:—

(*r*) The so called principles of Liebig,* by which his theory of

* Traité de Chimie Organique, tom. 1, page 7.

organic acids is preceded, are mainly an inversion of the truth; since they make the capacity of saturation of hydrated acids dependent on the quantity of hydrogen in their basic water, instead of making both the quantity of water, and, of course, the quantity of hydrogen therein, depend on their capacity:—

(*s*) All that is truly said of hydrogen would be equally true of any other radical; while the language employed, would lead to the belief that there is a peculiar association between capacity of saturation, and the presence of hydrogen.

Prof. Bache drew the attention of the Society to the necessity of providing means for continuing the observations now making under the direction of the Society at the Magnetic Observatory, or of closing the Observatory: whereupon, on motion of Dr. Patterson, a special Committee was appointed, to report in regard to providing means for the continuation of the observations. Committee, Dr. Chapman, Dr. Patterson, Dr. Wood, Mr. Fraley, and Mr. Kane.

On motion of Mr. F. Peale, permission was granted to Mr. Justice, to have casts made from certain medals in the cabinet of the Society, under the direction of the Curators.

Stated Meeting, Oct. 21.

Present, thirty-nine members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From Fletcher Webster, Esq. Acting Secretary of State, dated Washington, 7th Oct. 1842, announcing the transmission to the Society of a number of volumes of Public Documents:—

From the Secretary of the Imperial Society of Naturalists of Moscow, dated 13th July, 1842, announcing that the Bulletin of the Moscow Society for 1842, had been forwarded to this Society:—

From the Secretary of the Botanical Society of London, dated 1st July, 1842, and the Secretary of the Royal Geographical Society of London, dated 12th Jan. 1842, severally ac-

knowledging the receipt of numbers of the Society's Proceedings:—and

From Mr. Jacob Snider, Jr. dated Philadelphia, 21st Oct. 1842, presenting to the Society a bust of the late John Vaughan, Esq.

On motion of Mr. Kane, it was resolved that the donation of Mr. Snider be accepted, and that the bust of Mr. Vaughan be placed as desired in Mr. Snider's letter.

The following donations were announced:—

FOR THE LIBRARY.

The United States' Almanac, or Complete Ephemeris, for the Year 1843. By John Downes. 8vo. Philadelphia.—*From the Author.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. IV. No. 4. 8vo. Philadelphia, 1842.—*From Dr. Patterson.*

Bulletin de la Société Impériale des Naturalistes de Moscou. Vol. XV. No. 2. 8vo. Moscow, 1842.—*From the Society.*

Catalogus Coleopterorum in Sibiria Orientali a Cel. Gregorio Silide Karelin collectorum, auctore G. Fischer de Waldheim. 8vo. Moscow, 1842.—*From the Author.*

Executive Documents, Second Session, Twenty-sixth Congress. Vols. I. to VI. inclusive. 8vo. Washington, 1840–41.—*From the Department of State.*

Reports of Committees, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

House Journal, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

Index to the Executive Documents and Reports of Committees of the House of Representatives, commencing Dec. 1831, and ending March, 1839. 8vo.—*From the same.*

House Journal, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Senate Documents, Second Session, Twenty-sixth Congress. Vols. I. to V. inclusive. 8vo. 1840–41.—*From the same.*

Senate Documents, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Senate Journal, Second Session, Twenty-sixth Congress. 8vo. 1840–41.—*From the same.*

Senate Journal, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Executive Documents, and Reports of Committees, First Session, Twenty-seventh Congress. 8vo. 1841.—*From the same.*

Resolutions, Laws and Ordinances, relating to the Pay, Half-pay, Commutation of Half-pay, Bounty Lands, and other Promises made by Congress to the Officers and Soldiers of the Revolution, &c. Twenty volumes. 8vo. 1838.—*From the same.*

Report from the Secretary of the Navy, communicating a Report on the Second Invention of Thomas S. Easton, for preventing Explosions of Steam-boilers. 8vo. 1842.—*From the same.*

Transactions of the Natural History Society of Northumberland, Durham, and Newcastle upon Tyne. Vols. I. & II. 4to. Newcastle, 1831—1838.—*From the Society.*

Account of the Magnetical Observatory of Dublin, and of the Instruments and Methods of Observation employed there. By the Rev. Humphrey Lloyd, D.D. 4to. Dublin, 1842.—*From the Author.*

The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 13. 8vo. London, 1842.—*From the Society.*

Proceedings of the Geological Society of London. Vol. III. Part II. Nos. 84, 85 & 86. 8vo. London, 1841–42.—*From the Society.*

Poésies Choisies de Jean-Simon Chaudron, suivies de l'Oraison Funèbre de Washington, par le même Auteur. 8vo. Paris, 1841. *From Mr. Du Ponceau.*

The paper, entitled "Extracts from a Mathematical Common Place Book," read at the last meeting, was, with the consent of the Society, withdrawn by the author.

Mr. Lea read a continuation of his paper on new fresh water and land shells, which was referred to a Committee.

This paper contains the following species:—

Unio Foremanianus. Testâ triangulari, compressâ, inæquilaterali, posticè angulatâ, ad latera planulatâ; valvulis crassis; natibus prominentibus; epidermide luteâ, valdè radiatâ; dentibus cardinalibus crassis; lateralibus crassis rectisque; margaritâ albâ. *Hab.* Coosa River, Ala.—*Dr. Brumby.*

Unio Haleianus. Testâ ellipticâ, subinflatâ, inæquilaterali; valvulis subtenuibus; natibus prominulis, ad apicem undulatâ; epidermide tenebroso-fuscâ, striatâ; dentibus cardinalibus magnis, compressis; lateralibus longis subcurvisque; margaritâ albâ et iridescente. *Hab.* Mississippi River, 30 miles above New Orleans. *Josiah Hale, M.D.*

Unio Dariensis. Testâ oblongâ, subinflatâ, inæquilaterali, posticè perangulatâ, ad latera planulatâ, valvulis subcrassis, natibus prominulis; epidermide luteo-fuscâ; dentibus cardinalibus compressis; lateralibus longissimis lamellatisque; margaritâ albâ. *Hab.* Near Darien, Georgia. *J. H. Couper, Esq.*

Anodonta Dunlapiana. Testâ ellipticâ, inflatâ, subcylindraceâ, transversè vittatâ; valvulis tenuibus; natibus prominulis, undulatis; epidermide nitidâ, luteolâ, obsolete radiatâ; margaritâ albâ et iridescente. *Hab.* South Carolina.—*Mrs. Dunlap.*

Dr. Hare laid on the table some copies of an essay published in Silliman's Journal for July, entitled "Additional Objections to Redfield's Theory of Storms," for the use of such members as might take an interest in meteorological discussions.

In addition to the errors previously enumerated as existing in the opinions and allegations, advanced in favour of that hypothesis, he had, in the essay now submitted, adverted to the following:—

Attributing winds to the rotary or orbitual motion of the earth, when by those forces no corresponding currents are produced in the ocean.

Alleging that, by a conflict with an island, or concentration by cliffs, a trade wind could be so accelerated and deflected, as to whirl with the fury of a hurricane.

Supposing that, if a whirlwind could be so induced, it could endure and could even receive an accession of force from a conflict with extraneous bodies; when, owing to the centrifugal force consequent to the gyration, the momentum must be rapidly communicated to the surrounding fluid, and thus be dissipated in a quantity of matter, increasing with the square of the distance from the centre.

The inconsistency of the characteristics of whirlwind storms, as made out by certain alleged "*reliable facts and observations*," of Mr. Redfield; such storms being represented as heaping up the air on the border of the centrifugal force, while, at the same time, carrying it, and other bodies, towards the centre, to be discharged at "*one extremity of the axis of rotation.*"

The contradiction in representing the barometric column as sinking when first exposed to the advanced portion of a whirlwind, and rising when under the rear portion; when it is admitted that, by the centrifugal force, an aërial accumulation must take place on all sides towards the border.

The inconsistency of representing the diameter of the most violent zone in storms, as usually much exceeding a hundred miles, the storm advancing twenty-seven miles per hour; and yet that an ob-

server, over whom the centre should pass, after exposure to the greatest violence of the whirl on one side, could be *suddenly* exposed to an equally violent but contrary wind on the opposite side.

The discordancy of the whirlwind theory (agreeably to which a storm, travelling towards the *north-west* and *whirling* to the *left*, must have its greatest velocity in a south-easter on the north-eastern limb, where the tangential velocity coincides with the progressive motion), with the fact stated by Edwards, and admitted by Redfield, that on the limb alluded to, in the storms alleged so to move, there is the least violence.

The obvious consequence, that if our north-eastern gales be due to a whirlwind, moving along the coast of the United States at the rate of twenty-seven miles nearly per hour, whirling to the left, the gyratory velocity on the south-eastern limb must be more than fifty miles per hour greater than on the north-western limb; so that a much more violent gale from the south-west, at sea, must be simultaneous with the prevalence of every north-eastern gale along the coast; all of which is contrary to experience.

The palpable inconsistency of representing tornadoes as generated by the conflict of winds, arising from the earth's motion, with islands, and yet as ensuing in a calm, where there are no active currents to meet each other.*

To this list of errors, the following, since detected, might be subjoined :—

In opposition to the "*long cherished theory of calorific rarefaction*," entertained by the modern meteorological school, Mr. Redfield ascribes all winds to a rotative movement, arising from rotary or orbitual motion of the earth, and conflicts between trade winds and islands, and yet denies that he has advanced any theory of storms upon assumed scientific principles.

He repeats that the general winds would be more uniform, brisk,

* If tornadoes originate in calms, where there are "*no currents to meet each other*," and if they be attended by vertical currents about the axis, this must of necessity be productive of centripetal currents, which will probably gyrate from their obliquity. But what other cause can be productive of the upward current under such circumstances, if it be not an inferior pressure over a central space?

Redfield's account of whirlwinds excited by fire demonstrates, that a cause producing an upward current in the atmosphere, may, under favourable circumstances, be productive of tornadoes and concomitant electrical discharges. See Silliman's Journal, for 1839, Vol. XXXVI. page 50.

and constant, than at present, were the temperature uniform all over the globe, and yet denies that he represents the agency of heat as *unnecessary* to the existence of winds.

As if affording support to his hypothesis, he continues his effort to show that there has been gyration during certain tornadoes, after it has been demonstrated that such gyration, being attended, *as he has admitted*, by an upward current about the axis, and an acceleration of velocity towards the centre of motion, is irreconcilable with whirlwinds arising from the causes to which he has referred, and *which have been inconsistently admitted by him to be productive of a centrifugal force, determining the air towards the circumference.*

Founding an accusation of error, upon a mistake of his own, in alleging that, when a storm travels from south-west to north-east, whirling to the left, the progressive motion will not conspire with that of the whirl on the south-eastern limb, so as to be productive of a south-wester of pre-eminent fury: whence this inference, that Mr. Redfield cannot perceive one of the most palpable and inevitable consequences of his own doctrine, even after it has been pointed out to him.*

Subsequently to the preparation of his second essay respecting the errors of Redfield, Dr. Hare had found, in Dove's essay on the law of storms, other errors, of which he would now give a sketch.

Treating it as sufficient to show a cause of gyration in a wind blowing towards the equator, without assigning any cause for the peculiar violence of the wind, which, being thus made to whirl, is converted from a moderate trade wind into a furious hurricane.

Not perceiving that whatever bends the wind from a straight course, must cause a loss of some portion of its velocity; so that gyration must have the inverse effect of contributing to the unexplained accession of violence which accompanies the transformation alluded to: and further, that a travelling storm, as every whirlwind is represented to be, cannot be sustained unless the causes of violence travel with it; since any momentum, *locally* acquired, must soon be expended; and

* Agreeably to the observations collected by Loomis, the storms, in which the well known sudden change from south-west to north-west occurs, travel from north-west to south-east. But a change from the latter to the former direction can only take place in a whirlwind in travelling from south-west to north-east. Besides, as such storms have to cross the Alleghany mountains, is it not inconceivable that they should whirl? See Transactions, A. P. S. Vol. VII.

Can any mass of air be imagined to rotate, while a range of mountains is so situated as to cut it nearly in twain?

the more rapidly, on account of the centrifugal force causing a collision with inert portions of the atmosphere beyond the zone, at which the generating forces may have been applied.

The centripetal theory assumes that an ascending column about the centre of a storm, causes an afflux of wind from opposite quarters. Professor Dove alleges that such winds must neutralize each other, their intensity lessening more and more, as they approach their place of meeting. This shows that he does not understand the theory which he has undertaken to refute; since it must be quite evident, that, in rushing towards an ascending column, the velocity must become greater as the space within which the affluent air has to move becomes less.

It is also inferred by this negligent reasoner, that the sudden change of wind from one direction to another directly opposite, for which hurricanes are notorious, and in proof of which he adduces additional evidence, is inconsistent with the centripetal theory, upon the erroneous inference above noticed; when this suddenness of change has been shown to be irreconcilable with the idea that hurricanes are whirlwinds. In that case the wind would blow comparatively with little force within a large central area, which, at the rate of travelling admitted by him, would require several hours to pass over an observer, so situated as to be successively exposed to opposite winds.

That an upward current, having a base of 10,000 feet, or two miles nearly, would require more wind to supply it (if of equal velocity) than 400 of the largest tornadoes ever known to take place in the United States. It was believed that no tornado had been observed to have a focal area over 500 feet,* which would be only one-twentieth of the diameter above assumed, and of course the areas would be as 400 to 1.

According to Professor Dove, storms travel at the rate of thirty miles an hour. At this rate a focal area of 10,000 feet would require less than two minutes to pass over an observer, so as to subject him to winds blowing directly opposite to each other.

* The space within which the water rose, during the passage of a tornado over the river near Providence, in August 1838, was estimated by Mr. Allen at 300 feet. Of course, a focal area of 500 feet would have been productive of a tornado nearly three times as large; or as the square of 5 to that of 3, or as 25 to 9. See Silliman's Journal for 1840, Vol. XXXVIII. p. 77, or Transactions, A. P. S. Vol. VI.

It is taken for granted that the space, within which the water rose, was the focal area, or base of the ascending column.

Dr. Hare had prepared a communication for the American Journal of Science, in which he hoped to justify his summary statement of Dove's errors.

Prof. Henry communicated, orally, an extension of the experiments, which he had previously brought before the Society, on electro-dynamic induction. He had succeeded in magnetizing needles by the secondary current in a wire more than two hundred and twenty feet distant from the wire through which the primary current was passing, excited by a single spark from an electrical machine.

Mr. Lea called the attention of the Society to two specimens of coal, taken from the large anthracite coal bed in the Pine Grove district.

One of the specimens was remarkable for its regular rhombic form, in which all the angles were 70° and 110°, the cleavage of each plane being nearly perfect. The other was part of a large specimen of carbon, scarcely changed from its condition as charcoal, the loose fibrous structure being nearly perfect, and the whole having very thin laminæ of pure anthracite, parallel with the fibre.

A portion only (2 or 3 feet) of this large bed, the dip of which is about 35°, presented the oblique cleavage, preserving that character throughout as far as could be observed.

Mr. Lea then made some observations on the disturbed condition of the whole of the southern coal field, and read a portion of a letter from the Athenæum, addressed by Mr. Lyell to Dr. Fitton, where he states that the conversion from the bituminous to the anthracite condition is "most complete where the beds have been most disturbed."

Mr. Lea did not think this was the case throughout this coal field; for Mr. Lyell seemed to have overlooked the fact, as shown in the sections of Mr. Taylor's reports on that part which passes through the county of Dauphin, and known generally to our geologists, that this, like the coal field of South Wales, insensibly graduates into bituminous coal. Such is the fact as we proceed westward in the southern coal field of Pennsylvania, the bitumen being yielded up in the more eastern part, as stated by Mr. Taylor, Prof. Silliman, and other geologists.

It is well known that the conglomerates and coal beds of Sharp Mountain (the southern border of this coal field) are nearly vertical at Tamaqua, Pottsville, Pinegrove, Goldmine Gap, Rauch Gap, Yellow Spring Gap, and Rattling Run Gap; but there is a great differ-

ence in the debituminization in these different districts; the eastern group varying from 5 to 7 per cent. in the proportion of volatile matter, while the western group has a much larger proportion, and varies from 9 to 17 per cent., differing but 1 or 2 per cent. from that of Blossburg, Queen's Run, Ralston and Cumberland, Md.; all these being on the eastern part of the great western coal field.

The attention of the Society having been called by the Librarian to the state of the manuscripts in the Library, it was, on motion of Mr. Kane, resolved that a Committee be appointed to consider the present condition of the manuscripts in the possession or custody of the Society, and that they report whether any and what action may be proper for their secure preservation, and for facilitating their usefulness. Committee, Mr. Ord, Mr. Kane and Mr. Frazer.

The following gentlemen were elected members of the Society:—

Rev. George Peacock, F.R.S., of Cambridge, England.

J. I. Clark Hare, Esq., of Philadelphia.

Prof. Benjamin Peirce, of Harvard University.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. NOVEMBER & DECEMBER, 1842. No. 24.

Stated Meeting, Nov. 5.

Present, twenty-seven members.

Mr. DU PONCEAU, President, in the Chair.

Letters were read:—

From Mr. Clark Hare, acknowledging the honour done him by his election as a member of the Society:—

From M. Quetelet, Secretary of the Royal Academy of Sciences of Brussels, dated 7th May, 1842, acknowledging the receipt of copies of the Transactions and Proceedings of the Society:—and

From Mr. C. N. Bancker, transmitting to the Society, three works of Mr. George Field, of Isleworth, England, as a donation to the Library.

The following donations were announced:—

FOR THE LIBRARY.

Reply to Dr. Hare's further Objections relating to Whirlwind Storms, &c. By W. C. Redfield. 8vo. New Haven, 1842.—*From the Author.*

Nouveaux Mémoires de l'Académie Royale des Sciences et Belles-Lettres de Bruxelles. Vol. XV. 4to. Brussels, 1842.—*From the Academy.*

Annales de l'Observatoire Royal de Bruxelles, publiées, aux Frais de l'État, par le Directeur, A. Quetelet. Vol. II. 4to. Brussels, 1842.—*From the same.*

Bulletins de l'Académie Royale des Sciences et Belles-Lettres de

Bruxelles. Année 1842. Vol. IX. Nos. 3, 4, 5 & 6. 8vo. Brussels, 1842.—*From the same.*

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia. For Aug. Sept. & Oct. 8vo. Philadelphia, 1842.—*From the College.*

Collections of the Georgia Historical Society. Vol. II. 8vo. Savannah, 1842.—*From the Society.*

Annales des Mines. Rédigées par les Ingénieurs des Mines. Troisième Série. Vol. XX. 8vo. Paris, 1841.—*From the Engineers of Mines.*

Journal Asiatique, ou Recueil de Mémoires, etc. etc. Publié par la Société Asiatique. Troisième Série. Vol. XIII. Nos. 73 & 74. 8vo. Paris, 1842.—*From the Society.*

Mémoires du Muséum d'Histoire Naturelle. Vol XIV. No. 7. 4to. Paris, 1827.—*From the Professors of the Museum.*

Archives du Muséum d'Histoire Naturelle, publiées par les Professeurs-administrateurs de cet Établissement. Vol. I. Parts 2, 3 & 4, 1839, and Vol. II. Parts 1 & 2, 1841. 4to. Paris.—*From the same.*

The Journal of the Royal Geographical Society of London. Vol. XI. Part 2. 8vo. London, 1841.—*From the Society.*

Address to the Anniversary Meeting of the Royal Geographical Society. By William Richard Hamilton, F. R. S. &c., President. 8vo. London, 1842.—*From the same.*

Chromatics; or an Essay on the Analogy and Harmony of Colours. By George Field. 4to. London, 1817.—*From the Author.*

Chromatography; or a Treatise on Colours and Pigments, and of their Powers in Painting. By George Field. 8vo. London, 1841.—*From the Author.*

Outlines of Analogical Philosophy: being a Primary View of the Principles, Relations and Purposes of Nature, Science and Art. By George Field. Two volumes. 8vo. London, 1839.—*From the Author.*

The Committee, consisting of Dr. Hays, Mr. T. R. Peale and Mr. Ord, to whom was referred, at the last meeting, the paper of Mr. Lea on new fresh water and land shells, reported in favour of its publication in the Transactions; which was ordered accordingly.

Mr. Ord communicated part of a letter which he had received from a very eminent European naturalist, expressing

the deep interest felt abroad in the researches of the late Antarctic expedition.

The writer had understood, that the gentlemen who composed the corps of scientific explorers had ceased to be in the service of the United States; and he referred in strong language to the wrong which would be done to science, as well as to the parties immediately concerned, if the task of arranging and describing the specimens they had collected, should be assigned to any but themselves. He spoke of the practice of other governments who had directed similar explorations in modern times—of the impossibility of securing exact fidelity and consistency of narrative, where one was appointed to digest the brief and hurried memoranda of another—and of the want of confidence which must always and every where be felt in a scientific account of the labours of naturalists, to which they had not individually contributed their personal recollections, and on their individual responsibility.

Mr. Ord concurred fully in the views of his correspondent. He reminded the Society of the agency which it had exerted, at the instance of a former Secretary of the Navy, in defining the positions and duties of the members of the scientific corps, in preparing the instructions under which they acted, and in digesting the requisitions for their use. He adverted to the fact, that, at the interview of consultation, which took place in the Society's Hall, between the gentlemen of the corps and the Secretary, aided by a commission which he had chosen from among the members of the Society, it was understood on all hands, that the department assigned to each scientific gentleman in the expedition, would be subjected to no other interference or control than what the service might require; and that each would have secured to him, on his return, all the honours which might be earned by his personal toil. Mr. Ord expressed a belief, founded on his recollections of that interview, that these assurances, by satisfying the minds of the members of the corps, had the effect of disembarrassing the action of the Secretary from the questions of rank and precedence which had arisen among them; and he regretted that the informal character of the interview had, perhaps, left the circumstances which he mentioned, without a record among the files of the Navy Department.

Stated Meeting, November 18.

Present, twenty-six members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From Prof. Peirce, of Harvard University, dated 10th Nov. 1842, acknowledging the honour done him by his election as a member of the Society:—

From Dr. Tidyman, dated Charleston, 12th Nov. 1842, in relation to certain autograph letters presented by him to the Society:—and

From Mr. Bossange, bookseller, of Paris, dated 10th Oct. 1842, addressed to the Librarian, offering his services to the Society.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. I. Nos. 17, 18 & 19. 8vo. Philadelphia, 1842.—*From the Academy.*

Seven Autograph Letters, addressed to Dr. Tidyman by distinguished persons in Europe.—*From Dr. Tidyman.*

Dr. Bache announced the decease, on the 26th ult., of Dr. William R. Fisher, a member of the Society, aged 34 years.

Mr. Lea made some remarks on the form and structure of those *univalve* shells, known as *turbinated* and *discoid shells*, and exhibited various species.

He stated that he was aware ten or twelve years since that some of the German mathematicians were engaged in the investigation of their forms, with a view to determine species mathematically. Mr. L. referred to the ingenious and learned papers of Prof. Mosely, in the Philosophical Transactions and Philosophical Magazine, on Conchiliometry, proving the conchospiral to be the logarithmic spiral. It would be difficult to deny the truth of Prof. Mosely's conclusion, that "to each particular shell is annexed a characteristic number, being the ratio of the geometric progression." A more accurate

verification can scarcely be imagined than that from the admeasurement of *Turbo duplicatus*.

Geom. ratio, 1.18.

Calculated.	Measured.
1.31	1.31
1.1098	1.12
.9401	.94
.7965	.8
.6747	.67
.5716	.57
.4842	.48
.4102	.41

Mr. Lea also exhibited to the Society a beautiful and nearly perfect specimen of an *Ammonite*, from the Oxford Clay, Chippenham, England, recently described in the Magazine of Natural History, and which presented, entire, the process extending from the aperture, which he passed some remarks upon.

Mr. Justice stated that he had examined the appearance of the moon, to verify the observations made at New Bedford, and that the phenomena visible were perfectly explicable, without supposing that any combustion was going on at the surface of the satellite.

Professor Bache stated that his attention had recently been particularly called, by a letter from M. Quetelet, Secretary of the Academy of Sciences of Brussels, to the general instructions for simultaneous observations of natural phenomena, issued by the Academy. Co-operation in the system of observations by observers in the United States being very desirable, Prof. Bache asked leave to offer the following resolution:

"*Resolved*, That a Committee of five members be appointed, to report to the Society what measures may be taken, most effectually to secure co-operation, by observers in the United States, in the system of observations of periodical natural phenomena, forming the subject of the instructions of the Brussels Academy of Sciences."

This resolution was adopted, and the following Committee appointed:—Prof. Bache, Dr. Patterson, Mr. Frazer, Dr. Griscom and Mr. Lea.

Prof. Bache communicated observations which had been

made at the Magnetic Observatory, of the number of meteors or "shooting stars," for three hours on the mornings of the 12th, 14th and 15th of November. The morning of the 13th was cloudy. The eyes of the observer were directed to the zenith and northward. The results are contained in the following table.

TIME.		APPARENT MOTION OF METEORS.				
		DOWNWARD.			UPWARD.	
Day.	Hour.	Eastward.	Westward.	North.	Eastward.	Westward.
Nov. 12th.	12 to 1 A.M.	4	1	2		
	1 to 2	4	8	1		1
	2 to 3	4	4			1
14th.	12 to 1 A.M.	3	4	1		
	1 to 2	5	7	1	1	2
	2 to 3	7	10			
15th.	12½ to 1 A.M.	4				
	1 to 2	6	4			
	2 to 3	3			1	

The greatest number observed in any one hour was 17, the least 4; the average number per hour during the three hours on the 12th, was 10; on the 14th, 14; and on the 15th, 7.

Stated Meeting, December 2.

Present, twenty-five members.

Mr. Du Ponceau, President, in the Chair.

The following donations were announced:—

FOR THE LIBRARY.

A Catalogue of the Officers and Students of Dartmouth College, for the Academical Year 1842–3. 8vo. Concord, 1842.—*From the College.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. IV. No. 5. Philadelphia, 1842.—*From Dr. Patterson.*

FOR THE CABINET.

An Inkstand of a new construction, invented by Mr. George Barnam.—*From the Inventor, by the hands of Mr. Baldwin.*

Mr. Lea mentioned that, by some inadvertence, he had used, in his papers read before the Society, several specific terms which were preoccupied. He proposed to change on that account

Melania rufa	to	*Melania rufescens.*
M. striata	to	*M. striatula.*
M. lævigata	to	*M. lævis.*
M. corrugata	to	*M. rugosa.*

Mr. Lea also mentioned, that he proposed the provisional name of *pressus* for a *Unio* which he called *compressus* in a paper read before the Society, until it should be ascertained whether or not the shell from the Tilgate beds (secondary formation in England,) called by Mr. Sowerby, *Unio compressus*, should prove to be a true *Unio*, of which he had great doubt.

Professor Bache communicated, orally, a description of a new induction inclinometer, by Professor Lloyd, of Dublin, and suggested a modification, by which the same instrument might be used to measure changes of declination and inclination.

In this new instrument of Professor Lloyd, the magnetism developed by the earth in a soft iron bar, placed vertically, is made to act upon a magnetic bar suspended in a horizontal position; the changes of inclination being deduced from the changes in the position of the horizontal bar. The modification proposed by Prof. Bache would, he conceived, be useful, when it was desirable to economize in the outlay for instruments, and when the director or a skilful assistant was the observer. Two pieces of soft iron are so placed on the opposite sides of the horizontal magnetic bar as not to change its position, one of them occupying the place of the vertical bar of soft iron in Professor Lloyd's instrument. By an obvious mechanical arrangement, the position of one of the pieces of soft iron is changed in a vertical line; so that a pole of different name comes into the horizontal plane of the axis of the suspended magnet, which is now deflected

by the sum of the forces developed by the earth's magnetism in the two vertical bars.

The practical question was whether the horizontal bar could be brought to rest, or nearly so, in time to observe its new position; the copper rectangles used in the declination instrument being obviously inadequate to produce this effect. Prof. B. stated that his first assistant and himself had both found this result practicable, even with the short intervals of term-day observations. This was effected by a change in the position of the movable vertical bar producing half the amount of deflection;—by allowing the horizontal magnet to make one excursion in the direction of the impressed force, and when in motion for the return, checking it by completing the change of position of the vertical bar.

Prof. Bache further proposed the use of tubes of sheet iron for the temporary magnets, as they can be more readily annealed, and all permanent magnetism may thus be more easily destroyed in them, than in bars.

The Treasurer presented the annual report of the state of the funds of the Society, which was referred to the Committee of Finance.

Mr. Lea, chairman of the Publication Committee, presented the annual report in relation to the Society's Transactions.

The number of subscribers to the Transactions is 107. The number of copies distributed in exchange with other Societies, &c., is 71, and the number sold to non-subscribers since the last annual report, has been 10. The balance of funds in the hands of the Committee is $283.32.

Stated Meeting, December 16.

Present, thirty-two members.

Dr. Bache in the Chair.

Letters were read:—

From the Academy of Sciences of Paris, dated 5th August, 1842,—the Royal Academy of Turin, dated 28th Oct. 1842,—the Society of Antiquaries of London, dated 18th Nov. 1842,—the Auxiliary Society of National Industry of Rio Janeiro,

dated 2d Oct. 1842, severally acknowledging the receipt of copies of the Society's Transactions and Proceedings.

The following donations were announced:—

FOR THE LIBRARY.

The Literary Age. Vol. I. Nos. 1 & 2. Edited by Reynell Coates, M.D. 4to. Philadelphia, 1842.—*From the Editor.*

Inventory of Philosophical Instruments, Experimental Apparatus, Models, Books, and all other Property, placed under the Control of the Building Committee of the Girard College for Orphans. 8vo. Philadelphia, 1842.—*From the Building Committee of Girard College.*

A Treatise on the Diseases of the Eye. By W. Lawrence, F.R.S. &c. &c. From the last London Edition. With Numerous Additions, and sixty-seven Illustrations. By Isaac Hays, M.D. 8vo. Philadelphia, 1843.—*From the Editor.*

M. Accii Plauti Amphitruo et Aulularia. Ex Editione J. F. Gronovii. Accedunt Notæ Anglicæ. Cura C. K. Dillaway, A. M. 12mo. Philadelphia, 1842.—*From the Editor.*

An Attempt to unite the different Theories concerning Light, Electricity, Galvanism and Magnetism. By C. Campbell Cooper. Part I. Identity of Caloric and Electricity. 12mo. Philadelphia, 1842.—*From the Author.*

Mr. Clark Hare and Mr. George Bancroft, recently elected members, were presented to the presiding officer, and took their seats.

Dr. S. G. Morton read the first part of a paper, "On the Form of the Head, and other Ethnographic Characters of the Ancient Egyptians," which was referred to a Committee.

In this paper, Dr. Morton first took a view of those nations with whom the Egyptians appear to have held intercourse, either for war or commerce, in the early epochs of their history; and among those whom he has been able to identify, from a comparison of the heads figured in the work of Rosellini, are the Celts, the Scythians, the Pelasgic and Semitic nations, the Hindoos, Arabs and Negroes. Dr. M's ethnographic observations have been made on one hundred crania of ancient Egyptians, obtained by Mr. G. R. Gliddon at seven different sepulchral localities, from Memphis, in Lower Egypt,

to Deboud, in Nubia; and the author has classed the whole series in the following manner:—

1. *Arcto-Egyptians;* under which designation are embraced the purer Caucasian nations, as seen in the Semitic tribes of Western Asia, and the Pelasgic communities of Southern Europe.

2. *Austro-Egyptians*, in which the cranium blends the characters of the Hindoo and Southern Arab; which people, in the opinion of the author, were engrafted on the aborigĩnal population of Ethiopia, and thus gave rise to the celebrated Meröite nations of antiquity.

3. *Negroloid* crania, in which the osteological development corresponds to that of the Negro, while the hair, though harsh and somewhat wiry, is long and not woolly; thus presenting that combination of features which is familiar in the Mulatto grades of the present day.

4. *Negro.*

In many of the crania, the Areto-Egyptian, Austro-Egyptian and Semitic characters are variously blended; while a few of them also present traces of Negro lineage, modifying the features of the preceding types. The author presented, in anticipation of another section of his memoir, the following tabular view of the entire collection of heads, in which each one is classed according to the preponderance of national organic characters.

SEPULCHRAL LOCALITIES.	Whole Number.	Arcto-Egyptian.	Austro-Egyptian.	Semitic.	Negroloid.	Negro.	Doubtful.
Necropolis of Memphis,	26	21	4	1			
Maabdeh,	4	2			2		
Abydos,	4	2	1	1			
Catacombs of Thebes,	55	28	16	4	5		2
Ombos,	3	1	2				
Philœ,	4	2	1			1	
Deboud,	4		4				
	100	56	28	6	7	1	2

It, therefore, appears that the Caucasian crania constitute nine-tenths of the whole number; that the Negroloid heads are about one in four-

teen; and that among them all there is but one unmixed Negro. It will also be perceived, that the Austro-Egyptian conformation increases in proportion as we ascend the Nile and enter Nubia.

The author refers the blending of the Arcto-Egyptian, Austral-Egyptian, and other communities, to three principal periods of Egyptian history, viz:

1. The conquest by the Hykshos or Shepherd kings, B. C. 2082, when the Egyptians of all ranks were driven into Ethiopia for a period of 260 years.

2. The Ethiopian dynasty of three kings, which lasted 40 years, beginning B. C. 719.

3. The conquest by Cambyses, B. C. 525, when the distinctions of caste and nation were comparatively disregarded for upwards of two centuries, during which period the people of Asia, Europe and Nigritia were freely admitted into Egypt.

Dr. Morton's ethnographical researches, conjoined with the evidence of history and the monuments, have led him to draw the following conclusions:

1. That Egypt was originally peopled by the Caucasian race.

2. That the great preponderance of heads conforming in all their characters to those of the purer Caucasian nations, as seen in the Pelasgic and Semitic tribes, suggests the inference that the valley of the Nile derived its primitive civilized inhabitants from one of these sources; and the greater proportion of this series of crania in Lower Egypt may, perhaps, serve to indicate the seats of early colonization.

3. That the Austral-Egyptian or Meröite communities were in great measure derived from the Indo-Arabian stock; thus pointing to a triple Caucasian source for the origin of the Egyptians, when regarded as *one people* extending from Meröe to the Delta.

4. That the Negro race exists in the Catacombs in the mixed or Negroloid character; that even in this modified type their presence is comparatively unfrequent; and that if Negroes, as is more than probable, were numerous in Egypt, their social position was chiefly in ancient times what it yet is, that of plebeians, servants and slaves.

Mr. Lea read a continuation of his paper on fresh water shells, which was referred to a Committee.

In this paper Mr. Lea describes sixteen new species of the family *Melanianæ*, viz., 12 *Melaniæ* and 4 *Anculosæ;* and also, 2 *Paludinæ*. Mr. Lea's catalogue of *Melania* embraces 266 species, 44 fossil and 222 recent; of which latter 161 are indigenous and 61

exotic.—88 species, inhabiting this country, have been described by Mr. Lea in his papers read before the Society. Besides these, his list of *Anculosæ* (separated from *Melania* by Mr. Say) embraces 33 species.

Mr. Lea proposed to change the following names used in his former papers, they being preoccupied.

Melania plicatula, to *M. Deshayesiana.*
Melania plicata, to *M. Meukiana.*
Melania exarata, to *M. arata.*
Planorbis lens, to *P. Brogniartiana.*

The following are descriptions of the new species embraced in this paper.

Melania Vanuxemiana. Testâ striatâ, obtuso-conicâ, solidâ, luteolâ, fasciatâ; spirâ breviusculâ; suturis impressis; anfractibus senis, subconvexis; columellâ supernè incrassatâ; aperturâ ovatâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania ovalis. Testâ striatâ, fusiformi, solidâ, luteâ, fasciatâ; suturis valdè impressis; anfractibus senis, subconvexis; aperturâ ovatâ, constrictâ, intus albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania Haysiana. Testâ striatâ, subcylindraceâ, solidâ, luteo-fuscâ; spirâ subelevatâ; suturis impressis; anfractibus planulatis; aperturâ parvâ, ellipticâ. *Hab.* Alabama.—*Dr. Foreman.*

*Melania excisa.** Testâ striatâ, subfusiformi, subcrassâ, luteolâ; spirâ ovato-conicâ; suturis impressis; anfractibus planulatis; aperturâ supernè excisâ, parvâ, ellipticâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania Ordiana. Testâ striatâ, pyramidatâ, crassâ, tenebroso-fuscâ; spirâ exertâ; suturis valdè impressis; anfractibus planulatis; aperturâ rhombi formam habente, parvâ, albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania brevis. Testâ striatâ, subcylindraceâ, subsolidâ, luteâ; spirâ breviusculâ; suturis impressis; anfractibus planulatis; columellâ supernè incrassatâ; aperturâ ovatâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania oliva. Testâ striatâ, ellipticâ, solidâ, fuscâ; spirâ breviusculâ; suturis valdè impressis; anfractibus convexis; columellâ incurvatâ, supernè incrassatâ; aperturâ ovatâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania Foremani. Testâ tuberculatâ, pyramidatâ, subcrassâ, luteo-fuscâ; spirâ elevatâ; suturis enormiter lineatis; anfractibus novenis, planulatis; aperturâ productâ, ad basim angulatâ et canaliculatâ, intus albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Melania torquata. Testâ tuberculatâ, subfusiformi, nitidâ, subtenui, luteâ; spirâ subelevatâ; suturis impressis; anfractibus septenis, subconvexis; aper-

* This species is remarkable for a deep cut in the superior portion of the lip, extending about one-fifth of the way round, resembling the genus *Pleurotoma.* When the animal shall be observed it may be found to be different from that of *Melania*; in which case Mr. Lea proposes the name of *Schizostoma* for it.

turâ productâ, ad basim angulatâ, intus albidâ. *Hab.* Tennessee.—*Dr. Foreman.*

Melania producta. Testâ plicatâ, subfusiformi, subtenui, corneâ; spirâ obtuso-conicâ; suturis impressis; anfractibus octonis, planulatis; aperturâ ellipticâ, albidâ. *Hab.* Tennessee.—*Dr. Foreman.*

Melania curvata. Testâ obtuso carinatâ, subpyramidatâ, subcrassâ; tenebroso-corneâ; spirâ subelevatâ; suturis impressis; anfractibus octonis, convexis; aperturâ parvâ, curvatâ, albidâ. *Hab.* Tennessee.—*Dr. Foreman.*

Melania expansa. Testâ lævi, subfusiformi, subcrassâ, luteolâ; spirâ obtuso-conicâ; suturis subimpressis; anfractibus quinis, subconvexis; aperturâ magnâ, expansâ, albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Anculosa incisa. Testâ lævi, ovato-gibbosâ, crassâ, luteo-fuscâ; spirâ brevis; anfractibus quaternis, planulatis; columellâ supernè incrassatâ; aperturâ magnâ, ovatâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Anculosa Foremani. Testâ lævi, ovato-gibbosâ, crassâ, luteâ, transversè lineatâ; spirâ brevissimâ; suturis impressis; anfractibus subplanulatis; columellâ percrassâ; aperturâ submagnâ, ellipticâ, albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Anculosa solida. Testâ lævi, ellipticâ, subcrassâ, luteo-fuscâ; spirâ exertâ; suturis impressis; anfractibus planulatis; columellâ incurvatâ, supernè et infernè incrassatâ; aperturâ elongatâ, ellipticâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

Anculosa flammata. Testâ lævi, ovato-gibbosâ, crassâ, luteolâ, obliquè flammatâ; spirâ brevissimâ; suturis impressis; anfractibus subplanulatis; columellâ supernè percrassâ; aperturâ submagnâ, ellipticâ, albidâ. *Hab.* Alabama.—*Dr. Foreman.*

Paludina incrassata. Testâ lævi, ellipticâ, subtenui, imperforatâ, tenebroso-corneâ; suturis subimpressis; anfractibus subconvexis; columellâ supernè incrassatâ; aperturâ subrotundatâ, parvâ, intus cæruleâ. *Hab.* Alabama.—*Dr. Foreman.*

Paludina coarctata. Testâ lævi, ovatâ, coarctatâ, crassâ, imperforatâ, olivaceâ; spirâ exertâ; suturis valdè impressis; anfractibus planulatis; aperturâ subparvâ, ovatâ, albâ. *Hab.* Alabama.—*Dr. Foreman.*

The Committee of Finance presented their report on the Treasurer's Accounts, referred to them for examination at the last meeting. The several appropriations recommended by the Committee for the service of the year were passed by the Society.

Mr. Lea, from the Publication Committee, announced the publication of Part 2, Vol. VIII. of the Transactions of the Society, and laid a copy of it on the table for the examination of the members.

On motion of Mr. Ord, it was ordered that the Proceedings of this Society be sent to the Literary and Historical Society of Quebec.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. JAN. FEB. & MARCH, 1843. No. 25.

Stated Meeting, January 6.

Present, twenty-three members.

Dr. CHAPMAN, Vice-President, in the Chair.

The judges of the annual election, held this day, reported that the following officers had been chosen for the present year:—

President.

Peter S. Du Ponceau, LL.D.

Vice Presidents.

Nathaniel Chapman, M.D.,
Robert M. Patterson, M.D.,
Franklin Bache, M.D.

Secretaries.

John K. Kane,
Alexander Dallas Bache, LL.D.,
Robley Dunglison, M.D.,
Joshua Francis Fisher.

Counsellors for Three Years.

Thomas Biddle,
Gouverneur Emerson, M.D.,
Isaac Lea,
Hartman Kuhn.

Counsellor for Two Years,

(In place of Philip H. Nicklin, deceased.)

Benjamin Dorr, D.D.

Curators.

Isaac Hays, M.D.,
Franklin Peale,
John Price Wetherill.

Treasurer.

George Ord.

Letters were read:—

From Rev. S. Wells Williams, dated Macao, 1st Sept. 1842, —Elliott Cresson, Esq., dated Philadelphia, 5th Jan. 1843,— and from Mr. George W. Ridgway, dated Philadelphia, 19th Dec. 1842,—announcing donations to the Society's library.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Geological Society of London. Vol. III. Part 2. Nos. 89, 90. 8vo. London, 1842.—*From the Society.*

Premier Voyage à la recherche des sources du Bahr-el-abiad ou Nil Blanc, ordonné par Mohammed-Aly, &c. &c., sous le commandement de Selim Bimbachi. 8vo. Paris, 1842.—*From M. Jomard.*

Accroissement de la collection Géographique de la Bibliothèque Royale en 1841. 8vo. Paris, 1841.—*From the same.*

The Pharmacopeia of the United States of America, by authority of the National Medical Convention, held at Washington in 1840. 8vo. Philadelphia, 1842.—*From the Revising Committee.*

The Poets and Poetry of America, &c. By Rufus W. Griswold, Third Edition. 8vo. Philadelphia, 1843.—*From the Editor.*

The Northern Lakes, a Summer Residence for Invalids of the South. By Daniel Drake, M.D. 8vo. Louisville, Kentucky, 1842.—*From the Author.*

Journal of the Franklin Institute. Third Series. Vol. 4. No. 6.—*From Dr. Patterson.*

General Therapeutics and Materia Medica, &c. By Robley Dunglison, M.D. 2 Vols. 8vo. Philadelphia, 1843.—*From the Author.*

Early Lessons in Chinese, or Progressive Exercises, &c.; especially adapted to the Canton Dialect. By S. Wells Williams. 8vo. Macao, 1842.—*From the Author.*

A Cycle of Eight Years in the Seasons of Britain. By Luke Howard, F.R.S., &c. 8vo. London, 1842.—*From Elliott Cresson, Esq.*

Account of the Induction Inclinometer, and of its Adjustments. By the Rev. H. Lloyd, D.D., F.R.S. 8vo. London, 1842.—*From the Author.*

The American Journal of the Medical Sciences. Edited by Isaac

Hays, M.D. New Series. No. 9. Jan. 1843. 8vo.—*From the Editor.*

On certain Medical Delusions; an Introductory Lecture to the Course of Institutes of Medicine in Jefferson Medical College of Philadelphia. By Robley Dunglison, M.D. 8vo. Philadelphia, 1842.—*From the Author.*

Mr. Walker presented a communication from Mr. Simeon Borden, describing the apparatus used by him in measuring the base line for his survey of the State of Massachusetts; and it was referred to a Committee, consisting of Mr. Walker, Dr. Patterson, and Professor Kendall.

Dr. Morton read the second part of a paper "On the Form of the Head, and other Ethnographic Characters of the Ancient Egyptians:" and it was referred to a Committee, consisting of Dr. Patterson, Dr. Dunglison, and Dr. Goddard, to whom the first part of the same paper had been referred.

Professor Bache communicated to the Society, that in consequence of the want of funds for the support of the Magnetic Observatory, the bi-hourly observations, and those for maxima and minima, had ceased with the first of the present year.* He further stated, that it was his intention to keep up the term-day observations, and also to have an observation of the magnetic instruments made each day, to connect the indications of the magnetometers from one term-day to another. Certain of the meteorological observations were also to be continued.

Dr. Bache, late Reporter, announced the publication of Nos. 23 and 24 of the Society's Proceedings, which complete the series for 1842.

The Secretaries reported, that Dr. Dunglison had been charged with the office of Corresponding Secretary, and Mr. Kane with that of Reporter, for the ensuing year.

* Subsequently resumed.—Reporter.

Stated Meeting, January 20.

Present, thirty-five members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Societé de Géographie, dated Paris, 25th Aug. 1842,—the Lyceum of Natural History of New York, dated 10th Jan. 1843,—the Boston Society of Natural History, dated 1st September, 1842,—and the Royal Institution of London, dated 6th Oct. 1842,—severally acknowledging the receipt of donations from the Society.

The following donations were announced:—

FOR THE LIBRARY.

Flora Batava; ou Figures et Descriptions de Plantes Belgiques, par J. Kops et F. A. W. Miguel, Livrn. No. 125. 4to. Amsterdam.—*From H. M. the King of the Netherlands.*

Ancient Laws and Institutions of Wales, printed by command of His late Majesty William IV., under the direction of the Commissioners on the Public Records of the Kingdom. Folio. London, 1841.—*From the Commissioners on the Public Records.*

Osservazioni sullo Stato della Zoologia in Europa, &c. &c., da Carlo Luciano Bonaparte, Principe di Canino e Musignano. 8vo. Florence, 1842.—*From the Prince of Canino.*

Annales des Mines, 4me Sér. Tome I. 8vo. Paris, 1842.—*From the Engineers of Mines.*

Proceedings of the Geological Society of London. Vol. III. Part II. Nos. 87, 88. 8vo. 1842.—*From the Society.*

Bulletin de la Société de Géographie de Paris. 2me. Sér. Tome XVII. 8vo. Paris, 1842.—*From the Society.*

Journal Asiatique, ou Recueil de Mémoires, &c. &c. 3me. Sér. Tome XIII. No. 75. Tome XIV. Nos. 76, 77. 8vo. Paris, 1842.—*From the Asiatic Society of Paris.*

The Boston Journal of Natural History. Vol. IV. No. 2. Boston, 1842.—*From the Society of Natural History, Boston.*

The American Journal of Science and the Arts. By Professor Silliman and B. Silliman, Jr. Vol. XLIV. No. 1. 8vo. January, 1843.—*From the Editors.*

Exercises Pratiques d'Analyse, de Syntaxe, et de Lexigraphie Chinoise. Par Stanislas Julien, Professeur au Collége Royal, &c. 8vo. Paris, 1842.—*From the Author.*

Statement of Deaths, with the Diseases and Ages, in Philadelphia, during the year 1841. Published by the Board of Health.—*From Mr. Samuel P. Marks.*

Professor Bache announced the death of the Hon. Samuel L. Southard, a member of the Society, on the 26th June, 1842, aged 56.

Professor Bache described a dew-point hygrometer, the principle of which he believed had not been before applied to that instrument. A surface, of which the different points are at different temperatures, some above, and others below the dew-point, is exposed to the deposition of moisture; and the dew-point is indicated on this, by the temperature of that point at which the deposit ceases.

Several forms of the instrument were noticed. One for the purposes of an observatory, consists of a steel bar, one extremity of which fits into a tube passing through a metallic or a wooden box. The bar is pierced at regular intervals from the box with small cylindrical holes, passing vertically downwards from the upper surface of the bar to points below its axis, and intended to receive the bulb of a delicate thermometer. The temperature of the end of the bar within the box being reduced by cold water, ice, or a freezing mixture, the heat is gradually drawn from the part without. When equilibrium is attained, and the deposit of dew reaches a fixed position, the temperature of the bar at the dew line is ascertained, either directly by the thermometer, if the dew line corresponds with the axis of a cylindrical hole, or else by observing the temperatures of the holes on each side, and thus obtaining the temperature of the dew line, by a proportion. The intervals not being great, the curve, whose ordinates would represent the temperatures, the abscissæ being the distances from the extremity of the bar, may be taken as a straight line. Or, if more minute accuracy is sought, the bar may be pushed into the box until the section of deposition reaches the axis of a cylindrical hole. A copper bar, with gilded surface, may be used with advantage in certain cases, but does not present so beautifully defined a line of dew as the steel bar. Professor Bache spoke of the import-

ance of being able to observe a phenomenon of equilibrium instead of one of motion in taking the dew-point.

Another form of the hygrometer adapted to an observatory, or to occasional observations, consists of a trough, containing mercury, one face of which is of steel, or of gilded copper; the end being connected, as before, with a box for containing the materials, to reduce the temperature of the mercury in the trough. A deposit of dew having appeared on the surface of the trough, and having become stationary, so as to indicate that equilibrium is attained, a thermometer plunged in the mercury is brought opposite to this point, and indicates the temperature of the surface.

A very portable instrument of the same kind acting very rapidly, and if deemed advisable by the motion of heat, consists of a cylinder of small diameter, of copper, having a strip of gilding upon one side, and containing mercury. A thermometer, fitting loosely into this cylinder, has a slip of metal projecting downwards from the scale, which terminating opposite to the centre of the bulb, shows the position of the bulb when this latter is immersed in the cylinder. The temperature of the lower end of the cylinder being reduced below the dew-point, a deposit takes place upon the surface; and by following it as it advances, with the end of the projection from the thermometer scale, which gives the position of the bulb, the dew-point is readily ascertained.

Professor Bache gave further details in relation to these instruments, and compared their qualities with those of other dew-point hygrometers, and especially with the instrument of Professor Daniell. He stated, that at a future meeting he hoped to show to the Society the different forms of the instrument in action.

Mr. George Ord was elected Librarian of the Society for the current year.

The following standing Committees were appointed for the current year:—

Of Finance.—Messrs. C. C. Biddle, Patterson, Kuhn.

Of Publication.—Messrs. Lea, Hays, Fisher.

On the Hall.—Messrs. Campbell, Richards, G. W. Smith.

On the Library.—Messrs. Hays, Campbell, Penington.

The Committee on the trust funds reported upon the subject of the claims of the City Councils, which had been referred to them on the 19th August last, and presented certain resolutions in relation thereto, which were laid on the table.

The Society proceeded to an election for members, when the following persons were duly elected:—

His Imperial and Royal Highness, Leopold the Second, Grand Duke of Tuscany.

Louis Agassiz, of Neufchatel.

William W. Gerhard, M.D., of Philadelphia.

Lieut. Col. Reid, Governor of Bermuda.

Thomas P. Cope, of Philadelphia.

John Lenthall, of Philadelphia.

Solomon W. Roberts, of Philadelphia.

Ellwood Morris, of Philadelphia.

Charles Ellett, of Philadelphia.

Charles B. Trego, of Philadelphia.

The Cavaliere Mustoxidi, of Corfu.

Stated Meeting, February 3.

Present, thirty-one members.

Dr. Patterson, Vice-President, in the Chair.

Messrs. Roberts and Lenthall, members elect, were presented to the presiding officer, and took their seats.

Letters were read:—

From Mr. Thomas P. Cope, Mr. John Lenthall, Dr. W. W. Gerhard, Mr. Ellwood Morris, Mr. Charles B. Trego and Mr. Solomon W. Roberts, severally acknowledging the honour of their election as members:—

From the Corporation of the University in Cambridge, Massachusetts, dated 13th Jan. 1843, acknowledging the receipt of donations from the Society:—

From the National Institute of Washington, being a circular from the medical department thereof:—

From Mr. C. A. Lesueur, dated Havre, 20th Oct. 1842, presenting certain fossils:—

From T. I. Wharton, Esq., attorney of Mr. J. Brown Parker, dated 21st Jan. 1843, announcing his purpose to institute

certain legal proceedings affecting property of the Society; which was referred to a special committee, consisting of Mr. Fraley, Mr. Breck, Mr. Kuhn, and Mr. Williams.

The following donations were announced:—

FOR THE LIBRARY.

Proceedings of the Geological Society of London. Vol. III. Part II. No. 91. 8vo. 1843.—*From the Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 20, 21. 8vo. 1842.—*From the Academy.*

The African Repository and Colonial Journal. Vol. XIX. No. 1. 8vo. Washington, 1843.—*From the American Colonization Society.*

The President's Message to 27th Congress, 7th Dec. 1842.—*From the Hon. Joseph R. Ingersoll.*

Investigation upon the Coast Survey and the Construction of Standards, &c. By F. R. Hassler. 8vo. 1843.—*From Mr. Richard Norris.*

FOR THE CABINET.

A Case of Fossils collected by the donor in the environs of Havre, France.—*From Mr. Charles Alexandre Lesueur.*

Professor Bache exhibited in action to the Society several forms of the dew-point hygrometer described by him at the last meeting.

On motion of Mr. Lea, ten copies of the Transactions were placed at the disposal of the Committee of Publication, to be distributed to the proprietors of such scientific and literary journals as they may select.

Special Meeting, February 10.

Present, twenty-two members.

Dr. CHAPMAN, Vice-President, in the Chair.

Mr. Fraley, on behalf of the Committee appointed at the last meeting, made report; and on his motion, the Committee

was authorized to enter into negotiations with persons having claims against the Society, arising out of the purchase of the Museum property, and to conclude certain arrangements respecting the same.

Stated Meeting, February 17.

Present, twenty members.

Dr. BACHE, Vice-President, in the Chair.

Letters were read:—

From the Geological Society of London, dated 3d Nov. 1842,—and the Royal Asiatic Society, dated 5th Nov. 1842,—severally acknowledging the receipt of donations from this Society.

The following donations were announced:—

FOR THE LIBRARY.

Collections of the Massachusetts Historical Society. New Series. Vol. VIII. 8vo. Boston, 1843.—*From the Society.*

The African Repository. Vol. XIX. No. 2. 8vo. Washington, 1843.—*From the American Colonization Society.*

Third Annual Report of the New York Lyceum. 12mo. New York, 1842.—*From the Lyceum.*

Journal of the Franklin Institute. Third Series. Vol. V. No. 1.—*From Dr. Patterson.*

Report on the Geology of the State of Connecticut. By James G. Percival. 8vo. New Haven, 1842.—*From the Author.*

On motion of Dr. Chapman, it was resolved, that a Committee of five members be appointed, to consider the expediency of celebrating the centennial anniversary of the Society, in May next:—and

Dr. Chapman, Mr. Kane, Dr. Dunglison, Dr. Ludlow, and Mr. Fraley, were appointed.

The list of outstanding Committees was called over, and action had in regard to them.

Dr. Hodge was relieved from the duty of preparing a notice of the life and character of Dr. Dewees.

Stated Meeting, March 3.

Present, twenty-eight members.

Mr. Du Ponceau, President, in the Chair.

Letters were read:—

From the Geological Society of London, dated 5th January, 1843,—the Royal Academy of Sciences of Berlin, dated 15th August, 1842,—the Society of Arts, &c. dated London, 7th Nov. 1842,—acknowledging the receipt of the Transactions and Proceedings, and announcing the transmission of donations to the Library:—

From R. R. Gurley, Esq., dated Washington, 22d February, 1843, declaring his purpose to transmit to the Society the numbers of the African Repository, as they shall be published:

And from Col. Hugh Mercer, dated Fredericksburg, 18th Feb. 1843, stating that he had forwarded to the Society certain valuable papers, illustrative of the public career of his father, General Mercer.

The following donations were announced:—

FOR THE LIBRARY.

An Account of the Receipts and Expenditures of the United States, for the Year 1841. 8vo. 1843.—*From the Register of the Treasury, U. S.*

Abhandlungen der Königlichen Akademie der Wissenchaften zu Berlin, aus dem Jahre, 1840. 4to. Berlin, 1842.—*From the Royal Academy of Berlin.*

Bericht über die zur Bekanntmachung geeigneten Verhandlungen der Königl. Acad. zu Berlin, 1841–1842. 8vo.—*From the same.*

Proceedings of the Royal Astronomical Society of London. Vol. V. Nos. 25, 26. 8vo.—*From the Society.*

Industrie Française, Rapport sur l'exposition de 1839, par J. B. A. M. Jobard. 2 Vols. 8vo. Brussels and Paris, 1841, 1842.—*From the Author.*

Reports of the Pennsylvania Hospital for the Insane, &c. &c. By Thomas S. Kirkbride, M.D. 8vo. Philadelphia, 1842.—*From the Author.*

A Discourse on the Death of General Washington, delivered 22d Feb. 1800. By James Madison, D.D., &c. &c. 8vo. Philadelphia, 1831.—*From Col. Hugh Mercer, of Virginia.*

Biographical Sketches of Gen. Hugh Mercer.—*From the same.*

Philadelphia Directory, for 1841.—*From Mr. Du Ponceau.*

Report from the Commissioner of Patents, showing the Operations of the Patent Office, for 1842.—*From Hon. J. R. Ingersoll.*

Congressional Documents: Military Posts, U. S., 1842.—*From the same.*

Prof. Bache referred to the formula of Prof. Apjohn, for connecting the indications of the wet and dry bulb thermometer with the dew-point, to show that its results might approximately be obtained by a sliding scale.

He had constructed a scale for that purpose, in which, by making separate divisions on the moveable part for different heights of the barometer, and for temperatures above and below the freezing point, the correction for the barometer was applied to the scale at the same time that the dew-points above and below 32° were calculated. Mr. Charles M'Euen had very much simplified the original proposal, and Prof. Bache presented a sliding scale made by that gentleman; also a circular turning scale, made according to a suggestion from Mr. Lukens. Either scale is compact, and well adapted to use by observers who employ the wet bulb hygrometer. The approximation to the numbers of the formula is close, the scale referring to a mean tension of vapour, between that at the evaporating point and dew-point, while the corresponding term of the formula refers to the tension at the evaporating point. Prof. Bache observed that in this discussion it was necessary to assume that the formula itself is accurate.

The Committee, appointed at the last meeting, to consider the propriety of celebrating the hundredth anniversary of the Society, reported, and submitted the following resolutions:—

1. *Resolved*, That the American Philosophical Society will celebrate its centennial anniversary on the 25th of May next, and that the members be specially summoned to attend on that day.

2. *Resolved*, That a member of the Society be selected to deliver

a discourse upon the occasion, on the objects of the Society, its history, labours, and prospects.

3. *Resolved*, That a Committee of seven members be appointed, to devise and carry into effect such arrangements as may be proper for the centenary celebration.

The resolutions were adopted: and on motion of Dr. Chapman, Dr. Robert M. Patterson, one of the Vice-Presidents, was unanimously chosen to deliver the anniversary discourse.

Dr. Chapman, Mr. Kane, Dr. Ludlow, Dr. Dunglison, Mr. Fraley, Professor Bache, and Mr. G. W. Smith, were appointed the Committee under the third resolution.

Mr. Walker presented a letter, addressed to him by the City Solicitor, on the subject of the claim made by the City against the Society; which was referred to Mr. Kane, Mr. G. W. Smith, and Mr. Fraley, with instructions to report the state of facts of the case, and what action it is expedient for the Society to take thereon.

Stated Meeting, March 17.

Present, twenty-seven members.

Dr. BACHE, Vice-President, in the Chair.

Mr. Ellwood Morris, a member elect, was presented, and took his seat.

Letters were read:—

From the Imperial Society of Naturalists of Moscow, dated $^{12}/_{24}$ Sept., 1842,—the Cambridge Philosophical Society, dated 14th Nov. 1842,—and the New York Historical Society, dated 7th March, 1843,—acknowledging the receipt of the Transactions and the Proceedings of the Society:—

And from the Rev. William Cogswell, D.D., Corresponding Secretary of the Northern Academy of Arts and Sciences, at Hanover, N. H., dated 14th March, 1843, inviting an exchange of publications between the Society and the Academy.

The following donations were announced:—

FOR THE LIBRARY.

Bulletin de la Société Impériale des Naturalistes de Moscow. 1842. No. 3. 8vo.—*From the Society.*

Transactions of the Geological Society of London. Second Series. Vol. VI. Part 2. 4to. London, 1842.—*From the Society.*

Transactions of the Cambridge Philosophical Society. Vol. VII. Part III. 4to. Cambridge, 1842.—*From the Society.*

Report to the British Association for the Advancement of Science, on the Nomenclature of Zoology, June 27, 1842. 8vo. London.—*From the Association.*

Iconografia della Fauna Italica di Carlo Luciano Bonaparte, Principe di Canino e Musignano. Fasc. XXX. ed ultimo. Folio. Rome, 1841.—*From the Author.*

Researches in Physical Geology. By W. Hopkins, M.A., F.R.S. First, Second, and Third Series. 4to. London, 1839—1842.—*From the Author.*

Inaugural Address of the Hon. Albert Gallatin, LL.D., President of the New York Historical Society. 8vo. New York, 1843.—*From the Society.*

Constitution and By-Laws of the Northern Academy of Arts and Sciences; and First Annual Report of Curators. 8vo. Hanover, 1842.—*From the Academy.*

Survey of the Ohio River. By George W. Hughes, U. S. Topogr. Engrs. 8vo. 1843.—*From the Author.*

Instructions for Using Mr. R. W. Fox's Instrument for determining the Magnetic Inclination and Intensity. Published by order of the Lords Commissioners of the Admiralty. 8vo. 1842.—*From Mr. R. W. Fox.*

Journal of the Franklin Institute of the State of Pennsylvania. Third Series. Vol. V. No. 2. 8vo. Feb. 1843.—*From Dr. Patterson.*

Spinal Diseases, their Causes and Treatment, &c. &c. By Usher Parsons, M.D. 8vo. Boston, 1843.—*From the Author.*

The Literary Age. Reynell Coates, M.D., Editor. Published by G. W. Ridgway. Nos. 3 to 15. 4to. Philadelphia, 1843.—*From the Publisher.*

Annotazioni sul Veleno Viperino, del Cav. Conte Jacopo Gråberg de Hemsö. 4to.—*From the Author.*

Degli Ultimi Progressi della Geografia, del Cav. Conte Jacopo Grâberg de Hemsö. 8vo. Milan, 1842.—*From the same.*

An Eulogium on William P. Dewees, M.D., &c. &c. By Hugh L. Hodge, M.D. 8vo. Philadelphia, 1842.—*From the Author.*

Grammaire Egyptienne, ou Principes Généraux de l'Écriture Sacrée Egyptienne, appliquée à la representation de la langue parlée. Par Champollion le Jeune, &c. &c. Folio. Paris, 1836.—*From Professor John F. Frazer.*

Mr. Peale presented a copy of the letter dated 16th December, 1785, which accompanied the donation from his father, Charles Willson Peale, to the Society, of the portrait of Dr. Franklin, now in the Hall. The portrait is by Mr. C. W. Peale, from the original by Martin.

Prof. Henry D. Rogers submitted to the Society a brief account of the earthquake of the 4th of January of this year, stating some general views at which he had arrived concerning the direction and velocity of its transmission, and the nature of the movement.

By a reference to the facts in his possession, he showed that the earthquake was felt from beyond the Mississippi to the coast of South Carolina, and northward at least as far as Ohio and Indiana; and that this fortunate remoteness of the localities, both in latitude and longitude, tends essentially to promote the accuracy of the inferences deduced.

From a comparison of the observations at the different localities, as contained in the best statements collected, he endeavoured to show—

First. That the areas simultaneously disturbed were *linear*, or of the form of very elongated narrow belts.

Secondly. That the earthquake was progressive, and moved from west to east, the line of simultaneous disturbance shifting parallel to itself.

Thirdly. That it was thus propagated at the enormous velocity of *thirty miles per minute.*

Fourthly. That the facts of this earthquake lend decided countenance to a theory of the origin and nature of earthquakes, presented by himself and Prof. W. B. Rogers, in April last, to the Association of American Geologists, which attributes the movement to an actual billowy undulation on the surface of the liquid lava beneath the crust

of the earth, communicating to the latter its well known wave-like oscillation.

In the course of these demonstrations it was shown, that a comparison of the respective times of the arrival of an earthquake at three sufficiently distant places triangularly situated within the influence of the undulation, will enable us to calculate approximately the path and velocity of the wave, in all cases where it has, as in the instance before us, the form of a nearly straight line.

Major Graham had noticed the earthquake of the 8th of February last, at his house in Washington, at the N. W. corner of F. and Twentieth street West, three squares west of the Navy Department. The last and most severe shock which he felt, occurred at ten minutes before ten in the morning, mean solar time.

He felt the first agitation at about fifteen or twenty minutes before 10 o'clock, A. M. He was aroused from imperfect sleep, by a tremulous motion of the bed, which he at once referred to a slight shock of an earthquake. Having fallen into a doze again, he was a second time aroused by a similar shock, quite evident, though not severe: it caused the furniture in the room to shake. Soon afterwards he felt a third shock, so intense as to produce some apprehension that if it increased any in force, the house might fall. There was a sensible oscillation or rocking motion of the bed from north to south, or transverse to the direction in which he lay at that time. The furniture in the room shook with some violence, and a looking-glass, which stood upon a bureau, suspended within a square frame, standing in the usual manner upon a pedestal with drawers, was set to oscillating through an angle of about 50°, or 25° from a perpendicular in each direction. This last shock occurred at $9h\ 50m$, A. M., as observed by Major G. in his room. Its severity caused him to rise and join the other members of his family. On entering the room of one of them, who was an invalid, in the second story of the house, and immediately below the room occupied by himself, and on inquiring if the shock was noticed, the reply was, that two distinct and evident shocks had been felt, the last and most severe, at 10 minutes before 10 o'clock, as noted by a mantel clock which was in view at the time. The bed in which the invalid lay was caused to undulate sensibly, from north to south, or longitudinally of its direction. At the same time, a bunch of keys, attached to a metallic ring, hanging by a

single key in the door of a wardrobe, was set in motion, so as to produce a distinct rattling. A similar rattling of the keys was noticed by the invalid alluded to, two or three times in the night, between 3 and 5 o'clock, A. M., as nearly as recollected, when there was no one moving in the house.

Dr. Patterson, recurring to some of the views taken by Prof. Rogers, expressed a doubt whether the phenomenon of the earthquake may not be more properly regarded as a motion of the earth's crust, imparted to it directly from the originating cause, without necessary reference to the movement of the fluid beneath; and he compared it to the vibrations of sounding bodies, whether transverse or longitudinal.

Further remarks were made by Prof. Rogers, Prof. Frazer, and Mr. G. W. Smith, on the same subject.

Major Graham described a Reflecting Lantern and a Heliotrope, used by him as meridian marks for great distances, in 1841, while tracing, in his capacity of U. S. Commissioner, the due North line from the monument at the source of the River St. Croix.

The lantern was constructed by Messrs. Henry N. Hooper & Co., of Boston, under Major G.'s directions. It was similar in form to the Parabolic Reflector Lantern, sometimes used in lighthouses, but much smaller, so as to be portable.

The burner was of the Argand character, with a cylindrical wick, whose transverse section was half an inch in diameter, supplied with oil in the ordinary manner. This was placed in the focus of a parabolic reflector, or paraboloid of sheet copper, lined inside with silver about one-twentieth of an inch in thickness, polished very smooth and bright. The dimensions were as follows:—

	Inches.
Diameter of the base of frustrum of reflector, - -	16.
Distance of vertex from base, - - - - -	3.75
Distance of focus from vertex, - - - - -	2.25
Diameter of cylindrical burner, - - - -	.50
Diameter of a larger burner, which was never used, but which by an adapting piece could be easily substituted,	1.25

The instrument answered the purpose for which it was intended, admirably well, and was of great use in tracing the due north line. While it occupied the station at Park's Hill, 15 feet above the surface of the ground, or 828 feet above the sea, in the latter part of Septem-

ber, and early part of October, 1841, the light from it was distinctly seen with the naked eye, at night, when the weather was clear, from Blue Hill, whose summit, where crossed by the meridian line, is 1071 feet above the sea; the intervening country averaging about 500 feet above the sea, and the stations being 36 miles apart.

The light appeared to the naked eye, at that distance, as bright and of about the same magnitude as the planet Venus. Viewed through the transit telescope, of 43 inches focal length, it presented a luminous disc, of about 30 seconds of arc in diameter. From its brilliancy at that distance, Major G. has no doubt that it would have been visible to the naked eye at 50 miles, and through the telescope at 100 miles, could stations free from interposing objects have been found so far apart.

It was remarked, that the wick employed by Major G. was considerably smaller than that usually made, even for parlour lamps; and to this cause he attributed, in a great measure, the perfection with which the parallel rays were transmitted from the reflecting parabolic surface, so as to make them visible at so great a distance. Though a greater quantity of light is generated by a larger wick, the portion of rays reflected in a direction parallel to the axis, and which alone come to the eye, is smaller as the flame transcends the focal limit. The size of wick most advantageous for use, may easily be determined by experiment: Major G.'s impression is, that the smaller its transverse section, provided it is only large enough to escape being choked up by the charred particles, even one-third, or perhaps one-fourth of an inch, the farther the light would be visible.

It has occurred to Major G. that lanterns of this description might be used with great advantage as station marks, in extensive trigonometrical surveys requiring primary triangles of great length of sides. A revolving motion might be given to the lanterns, so as to make the light transmitted from them visible from many different stations within short intervals of time. Their simplicity, and the ease with which they are managed, would perhaps give them, for such purposes, a great advantage over the Drummond or Bude lights, even though they be not so brilliant as the latter.

The heliotrope, which he employed in the day time, was made by order of Mr. Hassler, at the instrument shop of the coast survey office. It was a rectangular parallelogram of good German plate glass, $1\frac{4}{5}$ by $1\frac{1}{5}$ inch in size, giving an area of reflecting surface of $2\frac{16}{100}$ square inches. This also was seen at the distance of thirty-six miles.

Dr. Morton read a continuation of his paper "On Egyptian Ethnography," already referred to a Committee.

The Committee appointed at the last meeting on the letter of the City Solicitor, reported at large; and it was thereupon *Resolved,* That a Committee of three persons be appointed to have charge of the interests of the Society which are involved in the claim asserted by the City Councils.

Mr. Kane, Mr. G. W. Smith, and Mr. Fraley, were appointed the Committee.

PROCEEDINGS

OF THE

AMERICAN PHILOSOPHICAL SOCIETY.

VOL. II. APRIL & MAY, 1843. No. 26.

Stated Meeting, April 7.

Present, thirty-five members.

Mr. DU PONCEAU, President, in the Chair.

Letters were received and read:—

From the General, *Chef d'Etat Major* of the Engineers of Mines of Russia, dated St. Petersburg, July, 1842, announcing the transmission of donations to the Society, by the order of Count Cancrine, Minister of Finances, &c. &c.:—

From the Secretary of the Royal Society of Sciences of Göttingen, dated 5th December, 1843, acknowledging the receipt of the Transactions and Proceedings of the Society:—and

From the Local Committee of the American Association of Geologists and Naturalists; informing the Society of the approaching meeting of the Association at Albany.

The following donations were announced:—

TO THE LIBRARY.

Annuaire Magnétique et Météorologique du Corps des Ingénieurs des Mines de Russie, ou Recueil d'Observations, &c., publiées par ordre de S. M. l'Empereur Nicolas I. sous les auspices de M. le Comte Cancrine, Chef du Corps, &c., par. A T. Kupffer: Année 1840. St. Petersburg, 1842. 4to.—*From H. E. Count Cancrine, &c. &c.*

Proceedings of the Royal Astronomical Society of London. Vol. V. No. 27. Jan. 1843. London. 8vo.—*From the Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. I. Nos. 22, 23. Jan. Feb. 1843. 8vo.—*From the Academy.*

The African Repository and Colonial Journal. March, 1843. Washington. 8vo.—*From the American Colonization Society.*

Schriften der in St. Petersburg gestifteten Russisch-Kaiserlichen Gesellschaft Für die Gesammte Mineralogie. 1r. Band. 11te. Abtheilung. St. Petersburg, 1842. 8vo.—*From Mr. Charles Cramer.*

The American Journal of the Medical Sciences. Edited by Isaac Hays, M.D. No. X. New Series. April, 1843.—*From the Editor.*

The Medical News and Library. Vol. I. No. 4. April, 1843. Philadelphia. 8vo.—*From Messrs. Lea & Blanchard.*

A New Universal Biography, &c. &c. By the Rev. John Platts. London, 1825, 1826. 5 vols. 8vo.—*From Mr. William S. Young.*

History of the Great Reformation of the Sixteenth Century in Germany, Switzerland, &c. By J. H. Merle d'Aubigné. New York, 1842. 3 vols. 8vo.—*From the same.*

The History of the Inquisition in Spain from the Time of its Establishment to the Reign of Ferdinand VII: Abridged and translated from the original works of D. Juan Antonio Llorente. Lond. 1827. 8vo.—*From the same.*

Life of Thomas M'Crie, D.D., Author of the Life of John Knox, &c. &c. By his Son, Rev. Thomas M'Crie. Philadelphia, 1842. 12mo.—*From the same.*

Sketches of the Higher Classes of Coloured Society in Philadelphia. Philadelphia, 1841. 12mo.—*From the same.*

Notice on the Beet Sugar. Translated from the works of Dubrunfaut, De Domballe, and others. Northampton, 1837. 12mo.—*From the same.*

A Map of North America, from the French of M. D'Anville; improved, with the back Settlements of Virginia and Course of the Ohio; with Geographical and Historical Remarks.—*From the Hon. C. J. Ingersoll.*

Dr. Hays invited the attention of the Society to the Reports of three papers recently read to the Geological Society of London relative to the Mastodontoid animals in the collection of Mr. Koch.

The first of these papers was by Dr. Grant. This distinguished naturalist, after a careful examination of Mr. Koch's collection, considers the genus Tetracaulodon, to be well founded. In his paper he

points out the general structure and peculiarities of the three principal Mastodontoid genera,—Mastodon, Tetracaulodon, and Dinotherium,—and gives the dental formulæ of each of them. For the determination of those of the two first named genera, Dr. G. states that he has relied entirely on the splendid collection of Mr. Koch, which affords ample means for the purpose. The results of his investigations coincide precisely with those arrived at by the author of this communication, and which were presented to this Society, in a paper read twelve years ago. As each has obtained his results from the examination of an entirely different series of specimens, they mutually confirm each other.

The second paper is by Mr. Alexander Naysmith. This skilful anatomist has made a microscopic examination of the structure of the tusks of the Mastodon giganteum, Tetracaulodon Godmanii, T. Kochii, T. tapiroides, and of the Missourium; and he states that the minute structure of all these five animals exhibit considerable varieties. The peculiarities in the tusk of the Missourium, he adds, certainly indicate a distinct species. These results cannot but be regarded as extremely interesting, though it must be admitted, Dr. H. remarked, that the actual value of these characters was yet to be determined. Dr. H. reminded the Society of what he had stated on a former occasion, that each tusk of the Missourium was in three pieces, and that it was far from certain that they all had belonged to the same animal, and therefore he must now express his regret that Mr. N. had not examined a section of each of the three pieces, or at all events had not stated in which piece the section he examined was made, as the middle piece Dr. H. thought had been inserted, and that to this was due the great length of the tusks and their peculiar curve.

The third paper was by Mr. Koch, and contains the results of this gentleman's researches, which in his opinion fully prove the Tetracaulodon to be a distinct genus.

Dr. H. stated, that whilst he still conceives, as he has done from the first, that the balance of evidence was in favour of the correctness of that opinion, still it was due to truth and science, that false weights should not be allowed a place in the scales, and therefore he felt it his duty to correct one or two of the statements made by Mr. Koch, and which are founded on careless observation.

Mr. K. asserts that the Mastodon in the Philadelphia Museum is a male, according to the construction and size of the pelvis, and the magnitude of the tusks in the upper jaw; yet there are no traces of

tusks in the lower jaw: and the specimen at Baltimore, which is considered to be indisputably a male, is also destitute of inferior tusks.

Now, Dr. H. remarked, if even we were sufficiently well acquainted with the osteology of the Mastodon to distinguish the male from the female pelvis, which he thought we were not, still Mr. Koch's inferences would be unfounded, because, 1st. the pelvis and the lower jaw in the Baltimore skeleton belonged to different individuals: and 2d. the lower jaw in the Philadelphia one was of *wood*, modelled after the former, whilst the pelvis belonged to a third individual.

Dr. H. then gave the following brief history of these skeletons.

That in the Philadelphia Museum, which is the most perfect, was disinterred by Mr. C. W. Peale, in 1801, on the farm of John Masten, near Newburgh, New York. The Baltimore skeleton was obtained by Mr. Peale, the same year, from a morass belonging to Captain Barber, eleven miles distant from Masten's. Both these skeletons were incomplete, and many of their deficiencies were supplied by artificial imitations of corresponding parts in each other, or of counterparts in themselves. The lower jaw, however, belonging to the skeleton found at Masten's, had been broken to pieces in the attempt to get it out, and the teeth and a few fragments only were preserved; and no lower jaw was discovered among the bones found at Captain Barber's. To complete this part in the Baltimore skeleton, a lower jaw was taken which had been dug up on the farm of Peter Millspaw; whilst for the same object in the Philadelphia skeleton, a model of this same jaw was made, and the teeth of the individual which had been preserved were inserted therein. The tusks found at Masten's were too friable to support their own weight; models of them were therefore made in wood, which were used in the construction of the skeleton.

The upper part of the head was not discovered, and this part was modelled after the cranium of the Elephant, an incorrect model, as has since been ascertained.

Prof. Bache communicated an extract of a letter from M. Quetelet of Brussels, stating that hourly meteorological observations were made at some fifty stations in Europe at the periods of the equinoxes and solstices, the observers corresponding with the Academy of Sciences of Brussels. M. Quetelet expresses the wish that the American Philosophical Society should become the centre of a similar union for the new world, and urges that the attention of men of science should

be called to the subject; he also enforces the necessity for conformity to the plan laid down in the circular of the Academy:—

Also a letter from Mr. James C. Reid, of the Erie Academy; containing the directions of the paths of thirty-eight meteors, or "shooting stars," observed by him on the 10th of August last, between 10 and 11 P. M.

Prof. Bache also stated, that observations are making at Cambridge, Mass., under the superintendence of Prof. Peirce, and by an appropriation from the American Academy, for obtaining the directions of the paths of meteors. The observations are made on the first clear night of each week from dark until 11 o'clock, and from 3 A. M. until daylight. The particulars recorded are the right ascension and declination of the points of first and last appearance of the meteor, the magnitude, and the general circumstances of the motion.

Professor Rogers gave illustrations, in addition to those presented by him at a former meeting, to show that the lines of simultaneous movement in the earthquake of the 4th of January last were nearly meridional, or from a little east of north to a little west of south; the wave passing in succession from west to east.

Prof. R. discussed the additional observations which he had procured in support of his conclusions; and comparing the action of this earthquake with that of others on record, remarked upon its coincidence with that going to produce great anticlinal flexures. He stated that he was engaged in examining the phenomena and motion of the earthquake of February the 8th; the focal area of which appeared to be an elongated ellipse.

Mr. Walker made an oral communication of the observations made upon the Comet by Prof. Kendall and himself, first seen at the High School Observatory on the 11th of March, and of the elements of its orbit, as they had computed them.

The ephemeris calculated from their elements gives an error of less than two minutes of space in the centre of the nebulous appearance corresponding to the nucleus of comets generally. Mr. Walker also noticed the observations and computations of Professor Loomis, Professor Peirce, and others, and indicated the special difficulties presented by the computation of the orbit of this comet, which, with or-

dinary measurements, must render the computed elements very doubtful. Mr. W. also remarked the general correspondence of its elements with those of the comet of 1689.

Professor Bache informed the Society that he had received a letter from the Hon. James M. Porter, Secretary of War, through the bureau of Topographical Engineers, making an allowance for the continuance of the observations at the magnetic observatory. In consequence of this liberal and well-timed supply of means, he said, the series of observations was resumed on the first of the present month.

The Society thereupon unanimously adopted a resolution, tendering its thanks to the Hon. James M. Porter, Secretary of War, for his judicious appropriation of means for the continued prosecution of the magnetic observations heretofore conducted under the auspices of the Society: and

The Committee of the Magnetic Observatory was instructed to communicate the resolution to the Hon. Secretary.

The Committee on the Centennial Celebration reported progress, and announced the measures which they had deemed advisable to take for furthering the objects of their appointment.

Mr. Kane, Reporter, laid upon the table the 25th No. Vol. II. of the Proceedings, for January, February, and March, 1843.

Stated Meeting, April 21.

Present, thirty-eight members.

Dr. PATTERSON, Vice-President, in the Chair.

Mr. Charles B. Trego, a member elect, was presented, subscribed the laws, and took his seat.

Letters were read:—

From the Secretary of the Massachusetts Historical Society, dated 11th April, 1843, inviting the Society's presence at the second centennial celebration of the Confederation of the New England Colonies on the 29th of May next:—and

From the Hon. John C. Spencer, inviting the attendance of the members of the Society at a meeting of the scientific and literary men of the United States, to be held in Washington, on the first Monday of April, 1844, under the auspices of the National Institution.

The following donations were announced:—

FOR THE LIBRARY.

Kongl. Vetenskaps-Academiens Handlingar, för år 1840. Stockholm, 1842. 8vo.—*From the Royal Swedish Academy.*

Årsberättelse om Framstegen I Fysik och Kemi, afgifven den 31 Mars, 1840; af Jac. Berzelius, K. V. A. Secret. Kemi, Mineralogi, och Geologi. Stockholm, 1840. 8vo.—*From the same.*

Årsberättelser om nyare Zoologiska Arbeten och Upptäckter, till Kongl. Vetenskaps-Academien afgifne för Åren 1837—1840; af C. J. Sundenwall. Stockholm, 1841. 8vo.—*From the same.*

Årsberättelse om Technologiens framsteg till Kongl. Vetenskaps-Academien afgifven den 31 Mars 1840; af G. E. Pasch. Stockholm, 1841. 8vo.—*From the same.*

Årsberättelse om Framstegen I Fysik och Kemi, afgifven den 31 Mars, 1840; af Jac. Berzelius. Stockholm, 1841.—*From the same.*

Tal om Jordbrakets närvarande tillstånd inom fäderneslandet, hindren för dess förkofran och utsigterna för des framtig—Hallet I Kongl. Vetenskaps-Academien vid Præsidii Nedläggande den 6 April, 1842; af August Anckarswärd, &c. &c. Stockholm, 1842. 8vo.—*From the same.*

Transactions of the Literary and Historical Society of Quebec. Vol. III. Parts 3 & 4. Vol. IV. Part 1. 8vo.—*From the Society.*

Twelve Annual Reports of the Council of the Literary and Historical Society of Quebec, from 1831 to 1843. 8vo.—*From the same.*

The African Repository and Colonial Journal. Vol. XIX. No. 4. 8vo.—*From the American Colonization Society.*

The American Journal of Science and Arts. Conducted by Prof. Silliman and B. Silliman, Jr. Vol. XLIV. No. 2. April, 1843. 8vo.—*From the Editors.*

Report of the Select Committee relative to the Renewal of the State Railways with Pennsylvania Cast-iron Rails: Mr. Trego, Chairman. April, 1843. 8vo.—*From Mr. Ellwood Morris.*

The Philosophy of Storms. By James P. Espy, A.M. Boston, 1841. 8vo.—*From the Author.*

Dr. Morton read a continuation of his paper on Egyptian Ethnography; which was referred to the Committee already in charge of his former communications under the same title.

Mr. Walker mentioned, that Professor Kendall and himself had computed anew the orbit of the comet of 1843, but without adding materially to the accuracy of the results obtained by them before. The ephemeris computed from this orbit gives the observed place from the 11th of March to the 10th of April within two minutes of space, the differences being sometimes positive and sometimes negative. Mr. W. compared the results obtained by different computers at home and abroad. He had no doubt from the observatory records, that the tail of the comet was first seen at the High School Observatory on the 25th of February.

Mr. Lea, on behalf of the Publication Committee, laid upon the table the 3d part of Vol. VIII. of the Society's Transactions, N. S.

On motion of Dr. Hays,

The Curators were authorized to have casts made of the tooth of the Mastodon Chapmani in the Society's Cabinet.

The Society proceeded to an election for members; when the following persons were duly elected:

Charles Wilkes, Lieut. U. S. N.

Charles M'Euen, of Philadelphia.

Stated Meeting, May 5.

Present, forty-two members.

Mr. Du Ponceau, President, in the Chair.

Messrs. Thomas P. Cope, Charles Ellet, Jr., and Charles M'Euen, members elect, were presented, subscribed the laws, and took their seats.

Letters were received:—

From the Professors of the Museum of Natural History of Paris, dated 28th Feb. 1843,—the Corresponding Secretary of

the National Institution, dated Washington, 24th April, 1843,—the Acting Secretary of the London Society of Arts, &c., dated London, 24th Jan. 1843,—the Proprietors of the Bowditch Library, dated Boston, March, 1843,—the Corresponding Secretary and Librarian of the Northern Academy of Arts and Sciences, dated Hanover, N. H., 27th April, 1843,—the Librarian of the Massachusetts Historical Society, dated Boston, 28th April, 1843,—and the Corresponding Secretary of the Lyceum of Natural History of New York, dated 25th April, 1843,—severally acknowledging the receipt of recent numbers of the Transactions and Proceedings of the Society:—

From the Corresponding Secretary of the Massachusetts Historical Society; announcing that a delegation from that body will be present at the centennial celebration of this Society:—and

From the Hon. J. M. Porter, acknowledging the receipt of a letter from a Committee of the Society, communicating its thanks for his intervention in sustaining the Magnetic Observatory.

The following donations were announced:—

FOR THE LIBRARY.

First Annual Report of the Secretary of the Commonwealth to the Legislature, under the Act of March, 1842, relating to the Registry and Returns of Births, Marriages, and Deaths, in Massachusetts. Boston, 1843. 8vo.—*From the Secretary of the Commonwealth of Massachusetts.*

Annales des Mines, Quatrième Série, Tomes I. II. 8vo.—*From the Ingénieurs des Mines.*

Royal Astronomical Society of London: Proceedings, Vol. V. No. 29. March 10, 1843. 8vo.—*From the Society.*

The Journal of the Royal Geographical Society of London. Vol. XII. Part 1. 1842. 8vo.—*From the Society.*

Journal Asiatique, ou Recueil de Mémoires, &c. &c. 3e Série. Tome XIV. No. 78. Octobre, 1842. 8vo.—*From the Asiatic Society of Paris.*

Boletin Enciclopedico de la Sociedad Economica de Amigos del Paiz. Año 4to. Tomo II. No. 1. Valencia, 1843. 8vo.—*From the Society.*

Fifty-sixth Annual Report of the Regents of the University of the

State of New York, March 1, 1843. Albany, 1843. 8vo.—*From the Regents of the University of New York.*

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia, Feb. March, April, 1843. 8vo.—*From the College.*

London Provident Institution: Twenty-sixth Report. 20th Nov. 1842.—*From Mr. William Vaughan.*

An Account of the Yearly Receipts and Payments of the London Provident Institution, from its Commencement, 22d July, 1816, to 21st Nov. 1842.—*From the same.*

A Complete Index to the Companion to the Almanac; from its Commencement in 1828 to 1843, inclusive. London, 1843. 12mo. *From Mr. Petty Vaughan.*

Journal of the Franklin Institute of Pennsylvania. Vol. V. No. 4. N. S. April, 1843. 8vo.—*From Dr. R. M. Patterson.*

Vindiciæ Sinicæ: dernière Réponse á M. Stanislas Julien; suivie d'un Parallèle de sa nouvelle traduction de Lao-Tsen avec une traduction précédente: par G. Pauthier. Paris, 1842. 8vo.—*From the Author.*

Simple Exposé d'un Fait Honorable odieusement dénaturé dans un Libelle récent de M. Pauthier; par Stanislas Julien. Paris, Dec. 1842. 8vo.—*From the Author.*

The Medical News and Library. Vol. I. Nos. 1, 2 & 5. Philadelphia. 8vo.—*From Messrs. Lea & Blanchard.*

Reports of the First, Second, and Third Meetings of the Association of American Geologists and Naturalists, at Philadelphia in 1840 and 1841, and at Boston in 1842; embracing its Transactions and Proceedings. Boston, 1843. 8vo.—*From Prof. H. D. Rogers.*

Annual Report of the Board of Trustees of the Massachusetts General Hospital, for 1842. Boston, 1843. 8vo.—*From Mr. John Pickering.*

Report of the Boston Committee, appointed by the Meeting, &c., on the subject of procuring a Telescope of the first class, &c. &c. 1843. 8vo.—*From the same.*

On the Determination of the Earth's Magnetic Force in actual Measure. By the Rev. Humphrey Lloyd, D.D. Dublin, 1843. 4to.—*From the Author.*

Mr. Walker made an oral communication relating to the comet of 1843; tending to show that the elements of its orbit,

as computed from observations, differ more from one another, than the more accurate of these differ from the elements of the comet of 1689, as recomputed by Professor Peirce of Harvard from the data collected by Pingré. The differences of the computed elements were, according to Mr. Walker, less than those of the computations made from the observations of Encke's comet in 1795. Mr. W. further submitted evidence of the identity of the comets of 1689 and 1843, drawn from the appearances of the two, and dissented from the conclusions of Professor Peirce, which make the latter identical with the comet of 1668.

Special Meeting, May 12.

Present, twenty-six members.

Dr. Bache, Vice-President, in the Chair.

Dr. Chapman, as chairman of the General Committee on the Centennial Celebration, and Professor Bache and Mr. Kane, as the chairmen of sub-committees charged with the detailed arrangements, severally communicated to the Society the further steps which had been taken by them.

It was then, on motion of Mr. Kane,

Resolved, That the Society will hold a special meeting at its Hall on Friday, the 26th instant, to receive communications from the members and friends of the Society on topics of scientific interest.

On motion of Dr. Chapman,

Resolved, That strangers may be admitted to the meeting of the 26th instant, on introduction by a member of the Society.

It having been intimated, that some of the members were desirous of receiving the correspondents and other friends of the Society at the Hall, on the evening succeeding the Centennial Discourse; it was, on motion of Mr. G. W. Smith, *Resolved,* That on the afternoon and evening of the 25th, the Hall be appropriated to that object, under the sanction of the Committee of Arrangements.

Stated Meeting, May 19.

Present, thirty-two members.

Dr. CHAPMAN, Vice-President, in the Chair.

Letters were received and read:—

From Lieut. Col. W. Reid, C.B., F.R.S., Governor of Bermuda, dated 24th April, 1843, acknowledging the honour of his election to membership:—

From the Corporation of Harvard University, dated 10th May, 1843,—the Connecticut Historical Society, dated Hartford, 9th May, 1843,—and the Secretary of the Linnean Society, dated London, 3d Feb. 1843,—acknowledging the receipt of recent numbers of the Transactions and Proceedings of this Society:—

From Longman, Brown & Co., dated London, 2d April, 1843, in reference to a work on Ornithology by George Gray, about to be published by them:—and

From Mr. J. B. Parker and his attorney, in reference to the sale of the Museum buildings.

The following donations were announced:—

FOR THE LIBRARY.

Philosophical Transactions of the Royal Society of London. For 1842. Part II. London, 1842. 4to.—*From the Society.*

List of the Royal Society of London, 30th Nov. 1842. 4to.—*From the same.*

Proceedings of the Royal Society, Nos. 54, 55, 1842. 8vo.—*From the same.*

Revised Instructions for the Use of the Magnetic and Meteorological Observatories, and for the Magnetic Surveys; prepared by the Committee of Physics and Meteorology of the Royal Society. London, 1842. 8vo.—*From the same.*

Tables for the Extemporaneous Application of Corrections for Temperature to Barometric Observations; deduced from the Tables published in the Report of the Committee of Physics of the R. S. By S. Elliott Hoskins, M.D. Guernsey, 1842. 8vo.—*From the same.*

Proceedings of the Royal Astronomical Society of London. Vol. V. No. 28. Feb. 1843. 8vo.—*From the Society.*

Observations on the Aurora Borealis, from Sept. 1834 to Sept. 1839. By Robert Snow, Esq. Printed for Private Circulation. London, 1842. 12mo.—*From the Author.*

On the Intimate Rationale of the Voltaic Force. By Alfred Smee, F.R.S. London, Dec. 1842. 8vo.—*From the Author.*

Lecture on the Application of Science to Agriculture, delivered before the Members of the Royal Agricultural Society of England, Dec. 9th, 1841. By Charles Daubeny, M.D., F.R.S. &c. London, 1842. 8vo.—*From the Author.*

On the Chemical Constituents of Crops. By Charles Daubeny, Professor of Rural Economy in the University of Oxford. London, 1842. 8vo.—*From the same.*

On the Public Institutions for the Advancement of Agricultural Science in other Countries, &c. &c. By Charles Daubeny, M.D. F.R.S. London, 1842. 8vo.—*From the same.*

The African Repository and Colonial Journal. Vol. XIX. No. 5. May, 1843. 8vo.—*From the American Colonization Society.*

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. 24 & 25. 8vo.—*From the Academy.*

Szent Biblia, azaz: Istennek ó és új Testamentomában foglaltatott egész Szentírás. Magyar Nyelvre fordittatott Károli Gáspár által. Köszegen, 1842. 8vo.—*From Mr. Charles Nagy, of Pesth, in Hungary.*

Professor Bache announced the death of H. R. H. the Duke of Sussex, late President of the Royal Society of London, and a member of this Society; who died on the 21st April, 1843, aged seventy.

Mr. Walker mentioned that Professor Kendall and himself had now succeeded in obtaining elements for calculating the place of the Comet with great accuracy.

He said that the elements which he had presented at the last stated meeting agree closely with those of M. Arago, just received, and published in the *Courier des Etats Unis;* but that he was satisfied from his more recent researches, that the elements then presented, and those also of M. Arago, led to unsatisfactory results; that the curve traversed by the comet differed from the parabola, and is now shown by the method of Gauss, to be a hyperbola. Mr. W. exhibited the computations made by Professor Kendall, Mr. Downes and himself, which threw the curve into the body of the sun. He said, that if sufficient reliance could be placed upon the normal places of the

comet from the High School observations, they would indicate that it may possibly have touched the sun. He thought that there were strong analogies between this comet and those of 1668 and 1689, which would indicate a period of $21\frac{1}{8}$ years; but further researches must be made before the question of the short period could be settled.

Professor Rogers suggested that in case of a contact or shock of two such bodies, the sun as the more solid would displace a portion of the comet, leaving the remainder to pass on; a suggestion which gave rise to an extended conversation on the subject of the comet, in which Dr. Patterson, Prof. Bache, Prof. Rogers, and Mr. Walker took part.

Mr. Kane, from the General Committee on the Centennial Celebration, and Prof. Bache, from one of the sub-committees, reported the several arrangements which they had concluded on the subjects referred to them.

On motion of Dr. Hays,

The Curators were authorized to have the head and other bones of the Mastodon, now at the university of Pennsylvania, and the skeleton of the Elephant, presented to the Society by the Asiatic Society, and now at the Museum, removed to the Society's cabinet.

END OF VOL. II.

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